“Charting the vowel space of Bequian creole”

Abstract: Little is known about the phonemic inventory and realizations of vowels in the Eastern Caribbean at present. Thomas and Bailey (1998) tried to examine the similarities between African American English and Anglophone Caribbean creoles but cite a lack of acoustic analysis of Caribbean creoles as one of the several stumbling blocks encountered. This dissertation aims to help build a better picture of how one island in the Eastern Caribbean articulates its vowels as well as to provide material to help answer questions such as what are similarities in terms of vowel spaces between AAVE and Anglophone Caribbean creoles. By using a mix of existing corpus data from Bequia and the development and implementation of a data collection we performed an acoustic analysis of the vowels and consonants in Bequia. Despite the challenges faced regarding literacy on the island this dissertation presents a basic descriptive framework of Bequian creole (BeqC)’s phonemic inventory and vowel space including a comparison to pre-existing literature on the phonology of the nearest island to Bequia. Overall this dissertation provides a starting point in understanding the acoustic properties of Anglophone Eastern Caribbean creoles. It also acts as something useable for comparisons with other Eastern and Western Caribbean creoles.

Exam number: 5659035

Word count (exc. appendices etc): 28,500

University of Edinburgh | MSc by Research | 2009

1.0 Table of Contents Page

1.1 List of figures and tables

2.0 Introduction

Over the past ten years the development of contemporary creole studies has overwhelmingly focused on syntactic questions with phonological questions being explored to a lesser degree**.** Thomas and Bailey's (1991) exarimination of the link between African American Vernacular English (AAVE) vowels and those of Caribbean anglophone creoles notes the lack of acoustic information about Caribbean creoles. Thomas and Bailey cite a more comprehensive look at creole vowels and the range of variation they show as necessary for further comparison with AAVE.

This underlines a key point that is lacking from Caribbean creole studies at present – detailed acoustic evidence of the phonemic inventories and the vowel spaces. To clarify our definitions before beginning when we say phonemic inventory we are referring to what sounds are used to signal a difference in meaning on the island across both consonants and vowels. The vowel space differs from the phonemic inventory as it relates to the phonetic realizations of the vowels such the position in the mouth they are articulated.

Without an analysis of the vowel space and phonemic inventory of a selection of Caribbean creoles across the region it is impossible to take a look at features of AAVE and establish what is unique to AAVE as opposed to originated from Caribbean Creoles as considered by Thomas and Bailey (1991). Before such questions can be tackled though further descriptive work needs to be done on the vowels used by speakers in the Caribbean. Asides from the acoustic analysis of Jamaican Creole from the PhD thesis "English Vowels: Their Surface Phonology and Phonetic Implementation in Vernacular Dialects" by Veatch (1991) there is very little in the way of such an analysis to date.

This lack of understanding about the phonemic inventory of speakers in the Caribbean also has commercial ramifications to new technology. For example hardware that uses automatic speech recognition (ASR) like the Apple iPhone rely on non-standard dialects phonetic information to make them useable by a wider range of users. Without accurate information and examples of the vowel space in general for the Caribbean such things that use ASR are awkward to use and can often be at best partially functional.

Considering this identified gap in creole studies, our dissertation hopes to contribute to the slowly growing pool of works on the phonology of creoles by providing an acoustic analysis of vowels of a small island in the Eastern Caribbean region, near Saint Vincent. There are two key goals of this project, the first of which is to identify both the different phonemic contrasts and the inventory of a small island, Bequia. The second goal we aim to examine is how speakers realize the phonemic inventory of the island and whether any phonological variation occurs. As we will discuss later in the introduction it has been noted in previous work carried out on BeqC by Meyerhoff, Sidnell and Walker (2005) and Meyerhoff and Walker (2007) that there is a high amount of variation between the three main settlements on Bequia. This leaves the question of whether this is demonstrated either on a realization level for vowels or consonants or on a prosodic level unanswered until now.

While at the start of this project there was little usable data for such an acoustic analysis of Bequian creole (BeqC), there was already a well compiled corpus of sociolinguistic interviews from speakers of BeqC that have formed the basis of several papers starting with Meyerhoff, Sidnell and Walker (2005)**.** As we will discuss later, much of this is not possible to use in an acoustic analysis due to several issues with the recordings however the corpus data enabled us to generate several hypotheses about the island's vowel space during the early phases of this project. The lack of minimal pairs in comparable phonetic environments did pose a problem though, as without even near minimal pairs taken outside of a regular conversation, plotting the island's vowel space would be difficult as a number of realizational factors would potentially have to be accounted for (e.g. differences caused by features such as assimilation or preceding or following words as well as prosodic factors like variation in word stress depending on meaning or word position). To enable a more complete vowel analysis, it became necessary to design and implement an experiment to collect vowel data from a sample of speakers from the island. As a discussion point in section **5** we shall also raise the issues in designing an experiment to gather phonemic data from islands like Bequia.

As well as giving as extensive an analysis of the vowel-space and phonemic inventory of Bequia as possible, we aim to give as much detail on the phonetic realizations of the consonants in BeqC as possible. Such an analysis will help to indentify similarities and differences between islands in the Caribbean in future that are not

related to the phonemic inventory of an island. For example Saint Vincent and Bequia may have the same phonemic inventories, but different realizations for some of those phonemes in terms of position.

2.1 Brief summary of phonological work in the Eastern Caribbean

Aceto (2004: 481-498) observes in the Handbook of Varieties of English that we know relatively little about the phonology of Eastern Caribbean creoles in general. As discussed in Aceto's chapter of the handbook - a greater deal of attention has been placed on syntactic issues perhaps in part due to their relevance to the origins of creoles. Although at present research on the phonemic inventories and vowel spaces of the Eastern Caribbean is virtually non-existent, there are some pre-existing works worth discussing from across the Western and Eastern Caribbean.

One of the first works attempting to give a brief summary of the vowels and realizations in Anglophone creoles in the Caribbean was Wells (1982) in "Accents of English 3: Beyond the British Isles". His summary gives a brief overview of the phonemic inventories of many of the islands in the Caribbean but given the scope of the "Accents of English" trilogy, the work lacks a full acoustic analysis to back the statements up. Wells manages to capture many of the interesting phonological features that occur broadly across the creoles seen in the Caribbean such as the effect of rhotic vs. non-rhotic dialects on vowel spaces as well as the apparent absence of a reduction vowel such as [ə]. The closest two areas to Bequia in geographical terms that Wells describes are those of Barbados and Montserrat. We will demonstrate by proxy of our findings later that these are by far not perfect matches for the vowel space of BeqC – a closer match both linguistically and geographically is Saint Vincent, as we will discuss in **2.3.**

Holm's "Reference Survey of Pidgins and Creoles" (1989) continues this overview of creole phonology giving slightly more of a description of Eastern Caribbean phonemic inventories. Whilst primarily focusing on a wider range of issues not limited to anglophone Caribbean creoles during the first volume of Holms (1989), during the second volume Holms discusses the phonemic inventories of Caribbean islands. Holm's work raises issues that were contemporary at the time but like Wells (1982) lacked a more thorough analysis of the vowels and consonants in each. The lack of acoustic analysis is highlighted by recent works such as Prescod (2004) who

presents evidence that counters points made by Holms on VinC. A testament to the work of Holm and Wells in the area though is that while certain points they raised have been contested by contemporary works using acoustic analysis, the majority of features noted are agreed to exist.

In the Western Caribbean, Jamaica has served as the subject of at least three different PhD theses on different phonological issues to date as well as at least as many papers on the phonology of the island. Examining a selection of these in chronological order, the first work that provided a comprehensive analysis of the vowel space of Jamaica outside of Wells (1973) was Veatch (1991). In his PhD thesis, Veatch describes the surface phonological structures using examples from the same three dialects covered in "Three Dialects of English" by Labov (1991) as well as using Jamaican creole as an extremely different dialect of English. Two speakers from the island are analyzed and provide us with acoustic evidence supporting the attested vowels observed by Wells (1982) for Jamaica. Veatch's analysis demonstrates a high level of analysis using two speakers from the region – using a range of statistical tests in addition to a well thought out set of measurements on the creole.

Since the initial acoustic analysis performed by Veatch there have been several studies of the vowel space of Jamaica carried out that build on the previous work on the island. These works include Meade (1996) who discusses the phonology and the orthography of Jamaican in greater depth which gave way to both a sociophonetic analysis of Jamaican in the PhD thesis of Beckford-Wassink (1999) but also a more sophisticated examination by Meade (2001) that draws attention to the development of children's language acquisition on the island and developed a richer set of data for the area. As Jamaica is located on the almost polar opposite side of the Caribbean to Bequia we have opted to not describe their vowel space and merely highlight the knock-on effect one good initial phonological study can encourage on an island. Another interesting use for a description of BeqC is raised by the work by Meade i.e. developing a further understanding of the acquisition of children's development in the region.

"The Phonology and Phonetics of Jamaican Reduplication" by Shelome A. Gooden (2003) is proof of the benefits that even one in-depth study can have as with an orthography and vowel space laid out it is possible to examine an array of other

phonological subjects on an island. While this study does not directly tie into the acoustic analysis of vowels in the Caribbean however it does demonstrate the collection of good quality data for phonetic analysis and a method for collecting target words similar to one we will discuss during our methodology for the experiment out in Bequia.

While Jamaica has received a considerable amount of attention over the past 15 years, the Eastern Caribbean has gone relatively unobserved in terms of their phonemic inventory and vowel spaces. The closest island to Bequia where any analysis has been done over the past ten years is Saint Vincent, approximately 15 kilometers away. The only acoustic analysis of VinC comes from chapter 2 of Prescod (2004)'s PhD thesis "A Grammatical Description of the Noun Phrases in the English-Lexified Creole of Saint Vincent and the Grenadines". During this chapter Prescod gives a basic overview of the phonemic inventory of VinC including an acoustic analysis of one speaker of VinC, building on the work done by Holm (1989) and revisits the key features of the dialect he described. Prescod highlights that at least one of 3 key points should be re-evaluated based on available data. Holm (1989) is cited as saying that neither reductive [ə] or [ʌ] exist in VinC however evidence presented by Prescod suggests that both speakers of mesolectal and basilectal VinC use these phonemes. Without giving a suitable acoustic analysis of the island's vowel space, such conclusions are ultimately impossible to make – as is commonly noted (such as in Ladefoged (2003)) while the ears are good indicators of whether a phoneme exists in a language – they are far from being infallible.

Without a larger sample of speakers across the island of Saint Vincent, we cannot assume too much from the analysis. As different speakers have different vocal tract lengths, which would affect how their vowel spaces appear, we must be careful to draw conclusions from a reasonable statistic sample of speakers. Therefore the analysis performed by Prescod does act as a rough functional orthography for representing VinC speech in her research but as stated in her thesis does not make for a formal proposal of their phonemic inventory.

Regardless of any issues with the overall representation of the island's phonemic inventory - this acoustic analysis reveals the importance of such work in the Caribbean. At the time, due to the massive scope initially required to do a survey on

the level of Wells (1982) and even Holm (1989), an acoustic analysis was not for the possible or practical to be performed at the time. Now though such tasks are possible and allow for precise measurements and information to be collected about speakers, allowing for a more accurate representation of speakers vowel spaces even from one speaker as shown in Prescod (2004).

Given the proximity of Saint Vincent to Bequia and the folk linguistic observations made by speakers of BeqC about differences between their language and speakers VinC, it would be remiss not to compare the two during the discussion section. However during this dissertation we shall assume nothing about BeqC and avoid making assumptions about BeqC based on what occurs in VinC despite their geographical proximity.

One of the few researchers to highlight areas of interest in the Eastern Caribbean is Aceto (2002) who gathered the available references available at present and drew attention to areas of the Caribbean that have been ignored until now. This formed the groundwork for Aceto and Williams (2003), which collected a series of papers on a wide range of topics across the Caribbean across a number of fields. While as a whole this does not add to our knowledge of the Eastern Caribbean's phonology, it does do a good job of highlighting the currently published material on Caribbean creoles in the field.

In the past two years there have been several undergraduate dissertations on different sociolinguistic topics such as Jenny Millman (2008)'s dissertation on negation in Bequia as well as sociophonetic topics such as Zoe Ng's (2008) paper on TH-Stopping in BeqC. Relevant to us particularly is the work of Ng (2008) on TH-Stopping in which she examines the variable described by Wells (1982:565), which sees the use of fricative versus plosive variants. We will discuss the TH-stopping phenomenon as we examine our hypothesis data in **4.1** as it is relevant to several potential items in the phonemic inventory of BeqC.

2.2 Sociolinguistic and historical overview of Bequia

Bequia is an irregular landmass spanning 7 square miles and is one of the largest islands in the Saint Vincent and the Grenadines, second only to Saint Vincent itself. It is 10 miles away from the Kingstown, the capital of St Vincent and the Grenadines

and has a population of approximately 5000 people. The island itself has an colourful history as summarized in the first chapter of Neil Price (1988) "Behind the Planter's Back", which tells the history of plantations on the island as well as the slightly more modern history of the island. Before the French established plantations on Saint Vincent and Bequia in 1720, Bequia was primarily used by the Carib Indians as a source of timber for constructing canoes. In 1762 the island was captured by English forces, which lead to the colonization of St Vincent, Bequia and other islands in the Grenadines. At this point plantation slaves were brought in from a number of locations, both from Africa as well as indentured slaves from other parts of the British Empire giving rise to a diverse population across the island. It is worth noting that a large percentage of the original population of Bequia left around 1835 when according to Price (1988), at which time the records show a decrease in the population from 3,000 (St Vincent Blue Book, 1835) down to 1,933 in 1851 (St Vincent Blue Book, 1851). From this point onwards information on where the extra population came from becomes a bit vague, some of which comes from ex-plantation workers and freedmen remaining on the island and squatting in old plantation lands though. With regards to the rise in population from 1,933 to current the current population of just over 5,000, the island has always been known for its fishing and in the past had a great deal of contact with trading vessels so it is possible to at least theorize where a lot of the population came from based that some visited the island on trading journeys and stayed. Many residents also tried to explain to us where the extra population came from, however many of the stories seemed contradictory and without evidence this is hard to verify the exact source of the influx of people to Bequia.

During the history of the island several key settlements were established and have grown over time. As shown in *figure 2.1* there are three main areas on the island. In the south there are two fishing villages, Paget Farm and La Pompe, in the past the two settlements have been known collectively as "Southside" although there is evidence on the island to suggest that a distinction has now grown between the two as residents on the island during data collection informed me that Southside only covered Paget Farm and its surroundings, how much this holds as a change in description for the area remains to be seen though as does whether it impacts on the vowel space at all. Both Paget Farm and La Pompe have had a great deal of contact with the outside

world since they were established, being fishing villages they have encountered a range of languages from English to Dutch.

In the central part of the island are three settlements including the island's "capital", Port Elizabeth. Speakers of BeqC have a clear distinction between residents of Port Elizabeth, Ocar (a small piece of land between the Port and Hamilton) and Hamilton – with a clear start and end point of each area that is not immediately obvious to non-residents of the island. There is no evidence to suggest Ocar has a different dialect to that of Hamilton though and many residents interviewed or spoken to describe themselves as speaking the same as people from Hamilton too – suggesting any differences between Port Elizabeth, Ocar and Hamilton are subtle if there are any linguistic differences.

Finally the last settlement of note for purposes of this dissertation is Mount Pleasant. This area is composed mainly of white residents of Bequia, said by some residents to originate from indentured slaves shipped over from Britain. However in reality the population of the area is a lot more mixed now, with people who are at least third or fourth generation to people whose parents moved to the island when they were young. Mount Pleasant has a reputation on the island for being a relatively middle-upper class area, supported by the fact many of the younger generation have the opportunity to go to University or abroad for a time to work. As an aside, certainly within the living memory of residents of Bequia, there was a time that anyone barring white-residents who tried to climb the hill up to the top of the village were stoned if spotted.

Figure 2.1 *A small map of Bequia's settlements today.*

Across Bequia there is agreement from speakers of BeqC that people from the main areas of the island (Hamilton, Mount Pleasant and Paget Farm) speak differently, however when pressed to describe what defines each one the result is normally a very vague answer due to a lack of meta-linguistic knowledge. With regards to the specifics of the differences in BeqC between speaker groups, Meyerhoff and Walker (2007) in "The persistence of variation in individual grammars: Copula absence in 'urban sojourners' and their stay-at-home peers, Bequia" highlight the topic and surrounding issues very well. Meyerhoff and Walker (2007) describe speakers of BeqC as lacking the meta-linguistic resources necessary to describe the differences well but manage to point out two potential sources of the variation. Firstly Meyerhoff and Walker indicate pronunciation features as being one of the potential areas – which could include phonological features such as the vowel space itself among others. The second, arguably biggest, area flagged from morphosyntax, which was investigated by Meyerhoff and Walker using data collected by residents of the island acting as interviewers.

In terms of prestige varieties of BeqC so to speak, if the residents of the island were asked to rate the "quality" of language from good to bad – while the middle points would perhaps not be agreed the varieties with the highest and lowest prestige would be almost unanimously agreed on by speakers. Residents of the island commonly agree that speakers from "Mount Pleasant" have the highest prestige, speaking closer to English than BeqC, while the variety from Paget Farm is said to have the lowest prestige. When pressed about what differences in the way someone from say Hamilton speaks compared to Mount Pleasant though, nobody could really give a precise answer. We shall examine this from a phonological standpoint to see if any variation is occurring either in the vowel space and consider possible kinds of variation amongst prosodic features.

3.0 Methodology

The methodology section is split into two parts – in **3.1** we discuss the formation of our hypothesis about the phonemic inventory of BeqC and any assumptions made about the dialect before visiting the island. How the hypothesized inventory was used to develop experimental materials and then used to collect data on the island of Bequia is discussed in **3.2**. Any modifications to assumptions made in this section or problems encountered due to the methodology while collecting data on the island will be discussed during our discussion section in **5.4.**

3.1 Hypothesis formation

3.1.1 Speaker information

While ideally it would be preferable to measure both male and speakers vowel spaces on the island, in this dissertation we focused on female speakers. This was primarily due to the better audio quality of a selection of female speakers in the Bequia. We also chose to limit ourselves to female speakers based on the time constraints as a result of doing a 1-year dissertation as opposed to a longer research piece where it would have been possible to collect more data from male speakers of BeqC.

Ages of selected speakers for the hypothesis data varied from 40 to 71 with two speakers from each of the three communities on the island selected: Mount Pleasant, Hamilton and Southside (one speaker from Le Pompe and one from Paget Farm). We treated the island as being split into these areas based on observations made by residents about differences between areas. One example of this is that people from Mount Pleasant claim their ethnicity to originally be Bajan or even Scottish, while the other two communities do not. Also residents of particular communities have noted differences in how they speak in relation to their neighboring communities too. Whether this is a phonological or grammatical occurrence is yet to be seen and shall be considered during this project if suitable evidence presents itself.

The other main criteria for speaker selection largely hinged around whether or not they were, as described in Meyerhoff and Walker (2007), as an urban sojourner or not. Urban sojourners leave the island for a large part of their adult life at least to work abroad in urban areas both in the UK and America, returning to Bequia when they eventually retire. While interesting findings have come to light regarding their

grammar, it is noted quite clearly that the residents who have been urban sojourners can sound very different to those who never left the island for work. A difference in how speakers "sound" could mean anything from grammatical differences to phonetic realizational differences so we chose to avoid any potentially misleading findings by excluding urban sojourners from our study.

3.1.2 Assumptions about the speech community

While not in the strictest sense an isolated community nowadays there is a reasonable argument that many members of the elder generations may be considered the remains of an isolated community. For example members of the community remain basically the same, some leaving for work abroad for most of their lives but eventually returning to retire. While this in itself is not evidence of an isolated community there are other trivial signs that the island's community is relatively stable. One speaker from the Paget Farm area distinguishes between those who live on the island and those who come from abroad when talking about who she opens up to:

"*I deal with more overseas people. I more acquainted to them.*"

This suggests that there is at least an underlying distinction between insiders and outsiders, though outsiders are not necessarily treated negatively. Additional trivial evidence comes from other speakers discussing how their parents never really left the island except for brief visits to nearby islands such as St Vincent. It is not uncommon in the course of the interviews to discuss how far back their families have lived on Bequia for, which is often for a minimum of two generations that they know of. This reinforces the fact that although nowadays travel and contact with other communities is far more common, in the case of elderly speakers there is a good chance they have been living as a part of a near-isolated community for most of their lives.

By assuming some of the speakers may resemble an isolated community, as pointed out in papers such as Wolfram and Hazen (2002) "Isolation within isolation: A solitary century of African American Vernacular English", there is a possible chance to see a snapshot of how their language was in the past. This means there is an outside chance of being able to see what BeqC has been like for longer than just the life of the subjects and we will elaborate on this in more detail after verifying if it is

true while in Bequia. We shall examine how much this is really the case though today on Bequia when collecting data – as one possibility when the speaker mentioned "overseas" people is that she was referring to anyone from outside of the Caribbean. If so then the island may well not be such a snapshot as features from neighboring islands such as Saint Vincent may have influenced BeqC over the past few decades.

3.1.3 Collection of hypothesis data

The audio files for the 6 speakers selected to form the sample group were examined using a computer with sufficient memory to handle the analysis of large (> 1GB) audio files. The primary requisite of any audio analysis software for this project was the ability to see transcriptions aligned to the speech file. It was also necessary to be able to quickly import samples from the longer audio files into software like Praat[1] quickly - to which end we chose ELAN[2], which fulfils these requirements. All original 6 .MP3 files from the corpus had to be converted into .WAV to be read by ELAN using standard audio conversion software - we used Adobe Audition but something free like Audacity would do just as an efficient job of this.

After an initial *a priori* examination of the hypothesis sample, some potential areas of interest in the phonemic inventory and vowel space were identified. To pursue these in further detail and form a hypothesis of the phonemic inventory of BeqC we required minimal pairs to understand if there were differences between sounds used for particular words – for example if there is a difference word initially between "*tan*" and "*dan*". To this end, first we took the Microsoft Word transcription files and using Office 2008 removed both line numbers and all lines not spoken by the subject. Finally we inserted manual line breaks wherever there were spaces in between words and copied the long list of words into an Excel Document, each one into a separate cell. With this we have useable word lists that are easily searchable for suitable minimal pairs.

[1] Boersma, Paul & Weenink, David (2009). Praat: doing phonetics by computer (Version 5.1.01) [Computer program]
[2] http://www.lat-mpi.eu/tools/elan/

Once this data was first collected upon - we assumed nothing about the consonants of BeqC and instead collected data across speakers using the three key criteria for defining consonants as raised in Ladefoged (2003):

1) What places of articulation are used for phonemes?
2) What manners of articulation are used for phonemes?
3) Is there a voiced/voiceless distinction between phonemes?

These criteria will be used both during the formation of the hypothesis data as well as for presenting the findings from the data collection trip to Bequia.

A similar process was employed with the vowels – first seeking out the monothongal vowels and observing any possible variations that may occur, such as the differences between [i] and [I], as well as attempting to consider their positions relative to one another. As discussed in **4.1** this did not yield vowel plots for what we found nor are the minimal pairs truly the same due to being taken from a phrase as opposed to from isolation.

3.2 Data collection in Bequia

While the Bequia corpus is good for many sociolinguistic uses, it lacks minimal or near minimal pairs that would be crucial to charting the vowel space as well as the other items in BeqC's phonemic inventory. Based on the corpus data we developed a hypothesis of both the vowels and consonants that make up the phonemic inventory of Bequia. How to use the hypothesis data to elicit the vowel tokens to compliment it from speakers in Bequia was a challenge that involved some careful thought though as we first had to devise the nature of the elicitation task we would use in Bequia then the details of that task.

3.2.1 Elicitation task options

Sociophonetic data collection can take many different forms – and it is important to consider different methods used before devising our own elicitation task. To name just a few of many styles used by sociophoneticians, Thomas and Bailey's (1998) examination of possible similarities between anglophone Caribbean creoles and African American Vernacular English (AAVE) involved using historical data already available collected from sociolinguistic interviews in the past – which to some extent

we are using with the already collected Bequia corpus to help form hypothesis data. On the other hand when it comes to active data collection others like Kerswill (1999) employed what they described as being in a more "Labovian quantitative tradition" when gathering information from children who were asked to perform several tasks over the space of two sessions including reading a word list, doing connected speech tasks and talking to their peers. Our study is related to ones like Kerswill's that elicited data from British children, which is perhaps more relevant than other studies performed by Lavov or others gathering data from adults as there is a distinct risk of a lower literacy rate on Bequia. This means that the techniques used to make elicitation sessions interesting fun for children may well have parallels applicable to the experimental design of this dissertation.

For Bequia any elicitation technique that involves a greater or lesser degree of literacy – such as reading a passage from a book initially - could be problematic as noted by others in creole studies such as Gooden (2003) who observes that in Jamaica literacy rates are not very high. Therefore it is necessary to consider methods to elicit a list of tokens useable for phonological analysis to help plot the vowel space of speakers from Bequia that does not require large quantities of reading on the part of the subject. One way that Gooden gets around this in Jamaica is by using picture cards as opposed to just word cards. The disadvantage of using only picture cards when trying to plot an entire vowel space as well as confirm the consonantal inventory of a language is that it is very difficult to get minimal pairs for every phoneme. For example, it is possible to devise minimal pairs if you can think of abstract concepts that are easily described if the speaker can read – however if based on pictures certain concepts do not transfer well and would lead to confusion.

Among other options that could be used during data collection on the island are standard elicitation tasks for phonetics that involve two speakers from the island working together such as a map task or a group interview. These exercises use semi-controlled data, in the case of questions structured to elicit particular vowels for a group interview while for the map task requires two maps, some with some matching locations and others that are different. Afterwards the speakers are asked to find different points and others that are a simple case of one speaker asking the other for directions to certain locations on the map. Given our limited time in Bequia a task that requires two speakers at a time combined with the sheer number of tokens

required from speakers to gather the vowel space of the island this task was decided to be not practical given the goals of this dissertation.

The conclusion after considering different methods including ones performed by sociophoneticians in the Caribbean already as well as standard elicitation tasks as proposed above was to split the data collection exercise in half. We placed all the major vowels we hypothesized as being in BeqC into picture card form and then devised fifty word cards using very simple words with basic sentences on the back to elicit the word both in isolation and in a context. Designing the word cards to use very rudimentary English maximizes their potential for use on the island, as education there is compulsory up to a certain age so the assumption is that basic reading skills are available to speakers.

For the picture cards, which served as the main body of the vowel data, we created 8 picture cards per vowel and 15 extra cards based on potential phonemes and phonological features. This lead to a total of 111 picture cards and 50 word cards being created overall. We designed the cards over two parts so that even if the word cards proved problematic to speakers of BeqC then we will still have enough good acoustic data to meet our two key goals. The picture cards have also been designed to elicit a full range of consonants from speakers as well in case of the above scenario where we have to discard the word cards, given the literacy rate of Bequia was not easily discernable before traveling to the island. We will discuss the advantages and disadvantages to using picture cards for this kind of experiment further in section **3.2.5.**

Although not related to the construction of the task – whilst having speakers identify the words we also planned to have speakers video-recorded articulating tokens. The reason behind this was to help understand if speakers appear to be using different places of articulation to other dialects of English, as a video recording of lip movement would help do this for consonants like stops or even approximants for example. However we decided that this should be an entirely optional measure for speakers to opt into or not as they see fit because not everybody is comfortable with being video-recorded. Discomfort could come from either a dislike for being recorded and knowing that even the experimenter can look back at them on tape or

just because they fear they may end up on a video sharing website such as Youtube, despite any promises agreed on the experimental consent and data usage forms.

3.2.2 Sample size, speaker information and constraints

While we had hoped to expand the amount of speakers in our dataset in the data collection phase to four times the amount of speakers per from the hypothesis set, time restraints prevented this. Instead we used a total of four speakers per area, giving a total sample size for Bequia of twelve. This is still an acceptable number to work with as to date most studies of Anglophone Caribbean creoles have used between two speakers such as Veatch (1991) to as low as one speaker in the case of Prescod (2004). In addition to the sample described above, supplementary picture card data was also collected from an additional four speakers in Mount Pleasant and two from Union Vale near Hamilton.

In terms of desired demographic of speakers, as our initial data revolved around women in Bequia we will match this requirement here, ideally looking for women between the ages of 35 and 80 as in our original corpus. As our main goal from this exercise is to provide a description of BeqC's phonemic inventory and vowel space, not to provide an analysis of sociophonetic change between genders or ages of speakers on Bequia, if age has to be relaxed to secure a number of speakers that meets this goal then this is a compromise that will be made while in the field. During our time in Bequia we defined urban sojourners purely as people who had worked abroad for over half a year and were careful to monitor any speakers data afterwards that may have misunderstood the criteria when asked due to islands like Saint Vincent being considered by many to not be that different to Bequia among other reasons. For example when asked where some speakers were from originally they would respond an area on Bequia when in reality after further probing it would turn out originally as children/teenagers they were from Saint Vincent or another island in the Grenadines. Interestingly native residents to Bequia, while lacking the meta-linguistic knowledge to describe any phonetic differences between areas on Bequia, were most forthcoming about differences between BeqC and VinC and this was demonstrated casually with a speaker although not recorded. Therefore perhaps even more so than between areas of the island, BeqC speakers can clearly identify people from Saint Vincent and vice-

versa which suggests there are salient differences be they phonological or not between the two islands.

As alluded to before, our biggest constraint while collecting natural phonetic data from speakers is the fact the interviewer is only on the island for three weeks total due to having to self fund a large portion of the collection exercise. However our plans as stated above have taken this constraint into account already to maximize the chances of acquiring an acceptable amount of data while in Bequia.

Although initially we intended to pay subjects for their work, after advice from a PhD student already on the island we revised this to providing a light refreshments for speakers but nothing significant to avoid any feelings of awkwardness or having to haggle over pay either in terms of money or in kind items.

3.2.3 Equipment used

For the data collection in Bequia we used a DAT recorder for recording data with the option of using one of two different microphones for the island: A headset microphone and a directional microphone with adjustable angle for capture of sound. We chose to offer speakers two microphones while on Bequia because there was a risk that speakers would feel uncomfortable with the headset microphone around their heads and with the chosen directional microphone which can be adjusted to have a relatively narrow angle (90 degrees) helps ensure an acceptable audio quality for the recording by limiting the potential background noise that the microphone can pick up. Naturally a headset microphone is better in terms of audio capture but in some cases it can be sore for the wearer to wear over a certain head size as well as simpler reasons like it increasing some people's awareness of participating in an experiment as opposed to just guessing picture cards for an acquaintance.

A digital video recorder was also brought out to Bequia to, if permitted, to allow speakers mouths to be recorded as they perform the elicitation task.

Software used for transcription and analysis of this software includes Praat and ELAN – both of which operate on either Mac OS X or Windows Vista, so a standard computer with sufficient processor power and hard-drive space capable of handling audio analysis are the only hardware requirements for the audio analysis phase.

The actual experimental materials were printed onto card then laminated to protect them from curling or getting damp in the humidity in the Caribbean. The isolated words and words on the back of the picture cards were meant to be in lower case as if speakers have only have a limited amount of ability to read they are more likely to be easily able to read lower case than upper case. Unfortunately due to a mix-up at the print shop the elements in question came back in upper case and due to time and financial restraints we were unable to have this changed. This minor deviation from the planned materials did not appear to faze speakers during data collection for the most part.

During data analysis in addition to analyzing formants manually we also made use of several scripts designed in Praat – these are included as appendices for reference purposes. We have also included examples of each picture card used in Bequia in **appendix 1**.

3.2.4 Experimental procedure and recording

Before carrying out the experiment all speakers were presented with an explanation of what will be expected of them as well as consent forms for data use and participation in the experiment. Due to the risk of poor literacy rates these forms were discussed and read out beforehand in addition to allowing subjects to read them for themselves so speakers know what they are agreeing to before beginning the data collection exercise. Subjects were also presented with the option of being video recorded as well as which microphone they feel comfortable using. Although we explained the benefits a headset microphone, the majority of our sample opted to use a directional microphone instead as it felt less intrusive.

Subjects were first be given the entire deck of 111 picture cards and be asked to shuffle the deck so that the vowel tokens do not get repetitive (i.e. 8 repetitions of different words with [i] in it may bore a speaker and not get as natural a response from them). To ensure that each word is treated as being in isolation and not part of a sentence or continuous speech we asked that speakers place cards down in a pile to the side afters saying what they see. This process gave at least a few seconds between words ensuring they do not become part of a greater phrasal domain. After this was done speakers were presented with the 50 word cards if they agreed to take part in that component. The same basic procedure would be obeyed again except now

speakers will be asked to say the sentence on the back of the word cards as well as the word in isolation. A small selection of speakers agreed to participate with the word cards so this data was not used to help calculate the vowel space.

This process for both picture and word cards was repeated 3 times each by speakers to allow us to calculate an average for each vowel token across speakers.

When the data was collected for vowel analysis we first transcribed the data in ELAN then extract each vowel token into isolated files and segmented it as appropriate using the IPA in Praat. This made the data usable for the final analysis of the vowel space.

3.2.5 Advantages and disadvantages of using picture cards to gather data

While deciding on the format for the elicitation task there were several advantages and disadvantages we had to weigh up in using the picture cards to gather data from speakers.

Firstly we considered the fact that you could only portray physical objects earlier – but there was one potential solution to this – namely using several picture cards to convey a more complex action that has no description easily represented by one picture alone. Attempts to compensate for this by using several pictures on one card to describe a concept you risk putting too much information on each picture card, which could result in cognitive overload for the subject meaning they would in the worst case be extremely uncomfortable continuing with an interview. Consequently such action would risk the entire study as word spreads between residents of an island as small as Bequia quickly and would run a high risk of discouraging other potential subjects from participating. Therefore we were restricted to physical items representable by a single picture.

Other options we considered included similar problems, for example one way of conveying abstract concepts would be to include a representative sample of the concept such as someone with empty pockets, or an empty wallet to represent poor then have the word underneath to help guide speakers. The downside to this though is it requires speakers to read a word as well, defeating the benefit of picture cards being interpretable without the speaker necessarily having to read. As a result of these

problems as well as taking into account the time limit faced, we concluded that the best way to proceed was with the experimental materials described above.

3.3 Experimental procedure for plotting the vowel space and identifying the phonemic inventory of BeqC

While collecting formant data from monothongs we exclusively used the data collected from Bequia during section **3.2**. Care was taken not to assume that the vowels are a monothongs immediately as vowels such as [i] or [e] could have an uplglide or downglide word finally or they may be diphthongs. To test for this we took the following measurements for across every vowel:

- 50 milliseconds into the vowel token-initially.
- At the mid-point of the vowel token.
- 50 milliseconds from the end of the vowel token.

With this information were able to tell if what we believe to be monothongs have an upglide or downglide or not. Assuming they do not have either an upglide or downglide then we represented them using the mid point of each vowel when calculating the average unless evidence suggests this is not representative of the sound for any reason.

In the case of diphthongs we sampled the same points as described for monothongs except we shall present each of the measurements so we can understand the transition between start, mid-point and end of vowels in **section 4.2**.

When two vowels appear to be either allophones within an area's speakers/across the island or when one vowel's position differs compared to the other areas, we performed appropriate statistical tests (primarily unpaired t-tests) to test their statistical significance.

To indentify the phonemic inventory we performed a systematic examination across all potential phonemes in BeqC. For this search we primarily used data collected from section **3.2.** However occasionally due to the removal of the word card element we had to refer back to the Bequia corpus, which we make not of when it was necessary. When identifying the inventory – we specifically looked for sound differences first based on the following criteria:

- Place of articulation (i.e. bilabial, alveolar, etc…)
- Manner of articulation (i.e. stop, nasal, etc…)
- Voicing distinctions (i.e. looking for phonemes with the same place and manner of articulation but have a voiced/voiceless distinction).

We represented each of these with evidence in spectrogram format, segmented trying to stick as closely as possible to the suggested rules laid out by Turk, A., Nakai, S. & Sugahara, M. (2006) who provide a well written guide to segmenting phonemes. Following the above criteria is essential as otherwise it is wholly possible to make simple errors when examining the vowel space of the island. For example if you were to try to look for a difference between [k] and [d] you would notice a difference but it would not tell us much about how speakers phonemic inventories work particularly differences in articulation.

4.0 Results

We have split our results section into two parts based on the two stages of our data collection. During the first part we will briefly state what our findings from the hypothesis data using the Bequia corpus data that formed the basis of our experimental materials for the fieldwork on Bequia itself. As the first part of our work acts as a prelude to the analysis of the collected data from Bequia, we will provide the solid evidence (*i.e. annotated spectrograms, formant readings, vowel plots and waveforms*) for phonemes existing in section **4.4**. For the majority of this chapter we will examine the findings from the data using picture card data from Bequia, looking at the vowel space of the island followed by an examination of the consonants used by speakers. As with any experiment there were both some minor problems and unexpected reactions from speakers, which will be discussed in section **5.4** in more detail.

4.1 Hypothesis data

The vowel data gathered from the Bequia corpus provided us with a rough idea of the vowels and consonants used by speakers of BeqC. However for two key reasons we will summarize below, we are unable to use the Bequia corpus for describing the full phonemic inventory used in BeqC. Throughout this section we will reference points made in part from the author's (2008) undergraduate dissertation on the subject.

First and foremost even if the same word tokens were extracted from each speaker, there would be a great deal of difference between phonetic environments and tokens within speakers. Namely that even if you were able to extract 8 examples of the same token that were not function words – you would then have to ensure each was in a similar place in a sentence with the same words on either side to make it a fair comparison. Although this again could have provided us with a rough vowel plot of speakers even if we could extract formants from each speaker then it would not be an accurate one. One of the biggest reasons for a reduction in accuracy is the lack of control on preceding and following phonological segments in a greater phrasal domain. Without control of these as when words are spoken in isolation then how the final segment of the preceding word can affect the vowel quality in the selected token. As a result each token would need to be examined with the preceding and following

words to provide context and would add a great deal of time and complications to any plotting hypothesized vowel plots.

A side effect of this would be that when comparing it to a vowel plot based on the actual data collected, any differences noticed may not be easy to interpret. As discussed in the methodology section we overcame the problem of creating exactly identical word contexts for speakers with low literacy skills by using picture so only having the picture's name and a pause on either side. The downside of this as covered already is that as it is only semi-structured meaning, you cannot guarantee a precise response from speakers.

The final point is one discussed in Partridge (2008) regarding the background noise in the Bequia corpus that makes many of the sample files used in the dissertation unusable for phonetic analysis. Unlike in Partridge (2008), we were able to be more selective with the corpus files chosen so the majority of them did not suffer from a bad signal/noise ratio as described by Ladefoged (2003) in "Phonetic Data Analysis", which is described as the strength of the signal from the speaker versus amount of background noise on the recording. Nonetheless speakers in certain areas such as Paget Farm and Hamilton still suffered from a bad signal/noise ratio. The result of this was that formant measurements for each vowel would have been extremely difficult making a vowel plot for the areas next to impossible.

These reasons made it very hard to compile a vowel plot of any real value for a hypothesis on the actual vowel space of speakers for any area of the island. Given the time which would be required to find enough tokens per speaker, the time was instead focused on preparing experimental material that would elicit a full range of vowel contrasts from BeqC instead.

Monothong	Example
i	*Bee*
I	*Bin*
e	*Bay*
ɛ	*Bed*
a?	*Bad*
ɑ?	*Barn*
o	*Boat*
ɔ?	*flog*
^	*Bun*
u	*Boot*

Diphthongs	Example
ai	*Kite*
ɔi	*Coin*
ɔu	*Cow*

Table 4.1 ***List of proposed vowels based on the hypothesis data.***

Therefore we looked for contrasts that could exist in a dialect of English such as [i]/[I], [ɛ]/[e] and [^]/[ɔ] using data with a good signal/noise ratio then compiled a list of potential vowels to test for when creating picture cards we could use when gathering minimal/near minimal pairs on the island. ***Table 4.1*** summarizes our hypothesized vowels used by speakers of BeqC from the corpus, we will provide a deeper analysis of the vowels based on the vowel plots from the picture card data in section **4.2.1**.

Table 4.1 shows several areas where, based on the available data and time constraints, we were unsure if a contrast existed or if they were different realizations of the same phoneme. For these vowels we have marked them with a question mark next to them until we present the findings from the picture card data. Had it been possible to draw a vowel chart for the three regions, many contrast questions may have been clearer before traveling to Bequia such as the status of low vowels in BeqC. However, as stated above, representative vowel plots was not possible and so the focus was on establishing comprehensive experimental materials that would illustrate all the contrasts in BeqC's vowel system.

If we were to put *Table 4.1* into terms similar to Wells (1982), there would be at least two extra vowels listed, lengthened versions of both [i] and [ɑ]. We tested for this where possible using data collected in Bequia and measured the durational differences between speakers on the island to see if there were lengthened versions of phonemes as observed by Prescod (2004: 58) that we discuss further in the section **5.1** and **5.2**.

We will also discuss in section **5.4** that due to certain unexpected events during data collection only a fraction of tokens examining [ɔ] were collected. What we to collected we uses to discuss what is known about the status of the vowel in BeqC.

For the consonants of Bequia, we approached the phonemic inventory in a systematic fashion based around the 3 key identifiers for consonants: Place of articulation, manner of articulation and the voiced/voiceless distinction between them. The result of this examination in the hypothesis data was the chart as shown in *Table 4.2*.

Manner of Articulation	**Place of Articulation**								
	Bilabial	*Labia-adental*	*Dental*	*Alveolar*	*Post-alveolar*	*Palatal*	*Velar*	*Labial-velar*	*Glottal*
Plosive	p b			t d			k g		ʔ
Nasal	m			n			ŋ?		
Trill				?					
Tap				?					
Fricative		f v	**? ?**	S **z?**	ʃ ʒ				h
Affricate					tʃ dʒ				
Approximant				ɹ	j			w?	
Lateral Approximant				l					

Table 4.2 ***Consonant chart based on the hypothesis data.***

During the compiling of *Table 4.2* a number of potential phenomena affecting the phonetic realization of elements of the consonants of BeqC were observed. We will briefly summarize the ones observed during hypothesis formation below.

In the case of interdental fricatives – while it is conceivable at this stage that they exist in BeqC, no evidence was shown during the examination of the hypothesis data. We did find prime examples of what Wells (1982) refers to as "TH stopping" in the corpus seeing [θɪŋ] becoming [*t*ɪŋ] as we demonstrate later using collected data. Wells describes TH-stopping as when the fricatives [t] and [d] are used where [θ] and [ð] would be used in standard accents of English, making word pairs like *three-tree*, *thin-tin* and *breathe-breed* homophonous pairs. It is possible that even when TH-stopping does not occur (*e.g. often word medially*) that labiodental fricatives [f] and [v] are used instead of interdentals. The topic of TH-stopping is covered in far greater depth in Ng (2008) however there is never a clear distinction with waveform and spectrographic evidence as to which fricative is used when TH-stopping does not occur. This means that speakers of BeqC could be using [f] and [v] instead of the interdental fricatives. This is one issue we will examine in more detail during our analysis of picture card data and during the discussion section.

During the examination of the Bequia corpus, we observed an effect caused by [ɹ] on preceding vowels. On a cursory examination of available data – [ɹ] also interacts with the voiceless alveolar plosive [t] in word initial clusters. The effect of this is that for words such as "*tree*" became [tʃɹi], as we will demonstrate in **4.3**.**1.** Another question we approached was if this [ɹ]-interaction effect applies to any other phonemes like the voiced alveolar [d] in words like "*drink*" or not.

Listening to the Bequia corpus data, we found what could be either word final voicing neutralization of plosives or partial articulation of word-final plosives. Consequently both the picture and word cards were designed to include several cards with this in mind to see if there was something happening word finally, be it something like neutralization or just a partial or no release as is common in varieties of English according to Ladefoged (2003).

Another interesting question of if data gathered in Bequia by the author of this dissertation differs in any way from the Bequia corpus collected by Meyerhoff, Walker and Sindell (2005) or not. We will compare some of the hypothesis data side-by-side to the data collected from Bequia to try and address this question in section **5.3**.

4.2 Plotting the vowel space of BeqC using picture card data

After data collection in Bequia we acquired a total of eighteen female speakers, eight from Mount Pleasant, four from Hamilton, two from Union Vale (who count themselves as speaking similarly to people from Hamilton) and four from Paget Farm. To give an even representation of each area we decided to have a sample size of 4 speakers from each of the three areas o develop vowel plots from.

To present the information in a concise and understandable fashion here we presented the vowel space of BeqC in three parts. Firstly in **4.2.1** to **4.2.3** we have plotted the vowel space of each area using the data collected in Bequia using picture cards. Each area has been calculated using the average first and second formant values across the same tokens in each speaker. In the case of diphthongs we chose to represent them in a way that shows their full transition instead of just indicating which direction they finish in. Finally we will compare the vowel spaces between areas and see if there are any differences worth noting.

Before describing any of the vowel spaces in more detail, ***figures 4.1, 4.2*** and ***4.3*** are represented in a format similar to how you would look at vowels on the IPA. That is to say that F2 values are inversely proportional to how far back the vowel is – so the higher the F2 value, the more fronted a vowel is. The F1 values account directly for the height of the vowel - the higher the F1 value, the lower the vowel.

Although we will discuss methodological issues in more depth in **5.4** there is one change to the experimental procedure that must be discussed first. Originally we planned to use word cards with sentences on the back of them to elicit certain vowel and consonant data. This task proved to be awkward for speakers and added almost double the time to interview time when speakers did agree to take part. Many speakers felt reluctant to take part overall when they were told reading full sentences was involved. Therefore we quickly dropped this component as the picture cards contained enough data for the complete vowel space barring one potential vowel that we will discuss later in this section. The effects of this change were overwhelmingly positive on data collection though. One example of this was when several subjects went as far as to often called their friends to get them to take part on the same day too.

4.2.1 Mount Pleasant:

Figure 4.1 demonstrates the mean vowel space of Mount Pleasant using an average of each speakers vowel tokens allowing us to see the central tendencies of each vowel. The vowel plot suggests that the most fronted vowel is [i] followed by [e], [I] and [ɛ] respectively as the front vowels of the area. Among the front vowels the only vowel with an outlying result is [ɛ], which can be seen at 600Hz for the first formant and 2,000Hz for second formant. After checking the rest of the speakers' vowels and re-examining them both manually and re-running the machine script it was concluded this speaker just pronounces [ɛ] with a higher F1 than her counterparts did.

The low vowels of Mount Pleasant are interesting as there appears to be one central low vowel [a] whilst [ɑ], if it is in fact a separate phoneme, is higher up. How this phoneme acts in Hamilton and Paget Farm will help to shed light on the status of [ɑ] in BeqC.

The furthest back vowel in Mount Pleasant speakers of BeqC is [o] with [u] higher and a bit further forward in the mouth while [^] appears to be the closest thing to a

mid-central vowel that BeqC has. This will be important later when we consider our data in relation to the statement of Holms (1988) regarding the use of [^] in VinC as well as Prescod's observations on this.

4.2.2. Hamilton:

While on an initial glance **figure 4.2** may seem to be different to **figure 4.1** – a closer examination reveals that this is due more to individual speaker variation than it is a statement about vowel positions on the island. Despite the [i] being a slightly lower height than in Hamilton – the front vowels are in the same relative position as their counterparts in Mount Pleasant.

The back vowel [u], however, appears to be potentially in a different relative position to those of Mount Pleasant though. This could be just because of the difference in tokens available as a portion of one speaker's tokens were unusuable due to background noise on the directional microphone. We will discuss this during section **4.2.4.**

Also relevant to notice before presenting the vowel space for Paget Farm is that in Hamilton the two traditionally low vowels appear to be far closer. For example [a] is still the lowest and most central vowel in this area however the [ɑ] is only slightly higher and is not more central than the [a]. We will readdress the low vowels when looking at the vowel space in general.

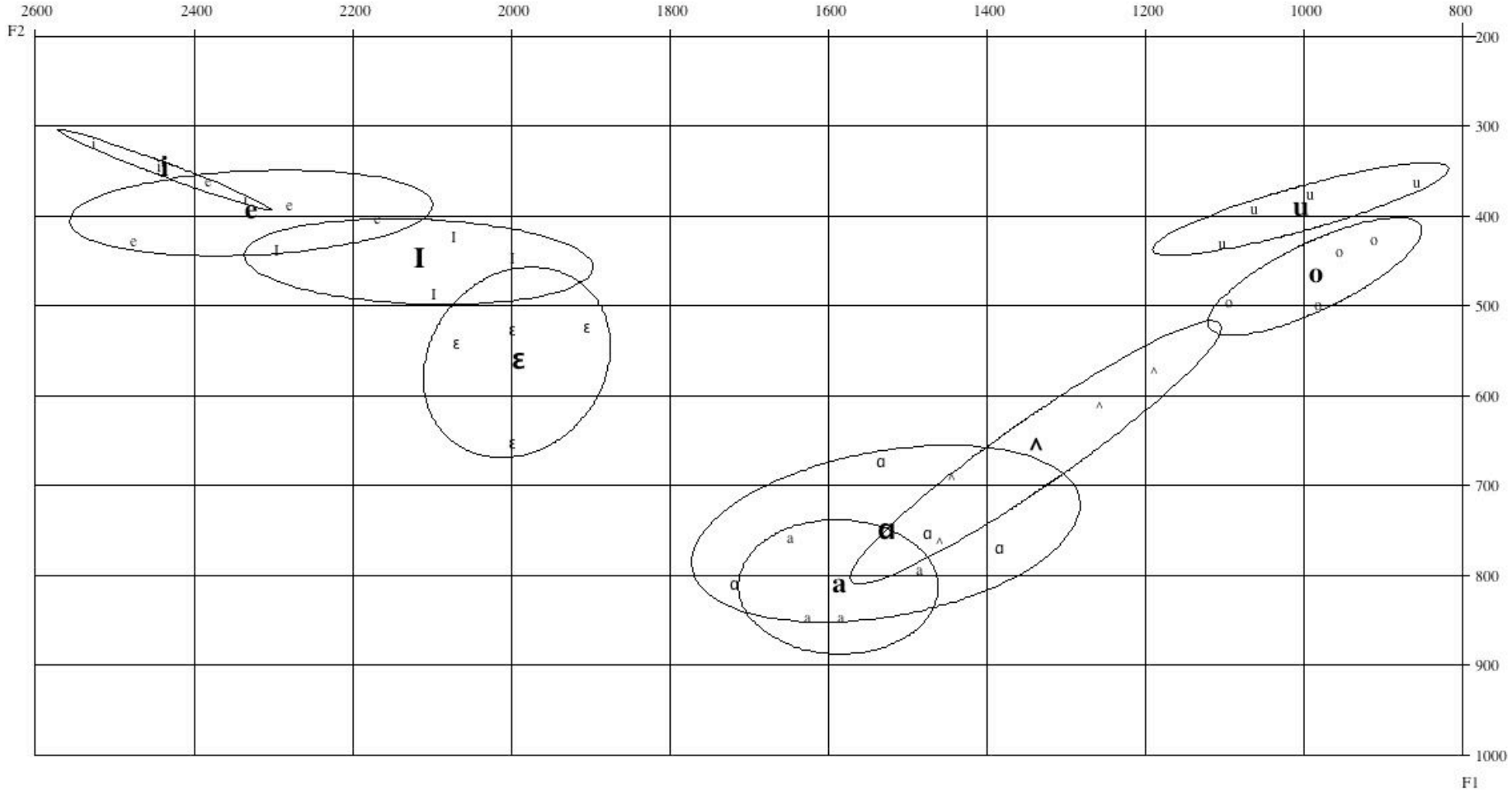


Figure 4.1 ***The vowel space of Mount Pleasant for monothongs based on collected data***

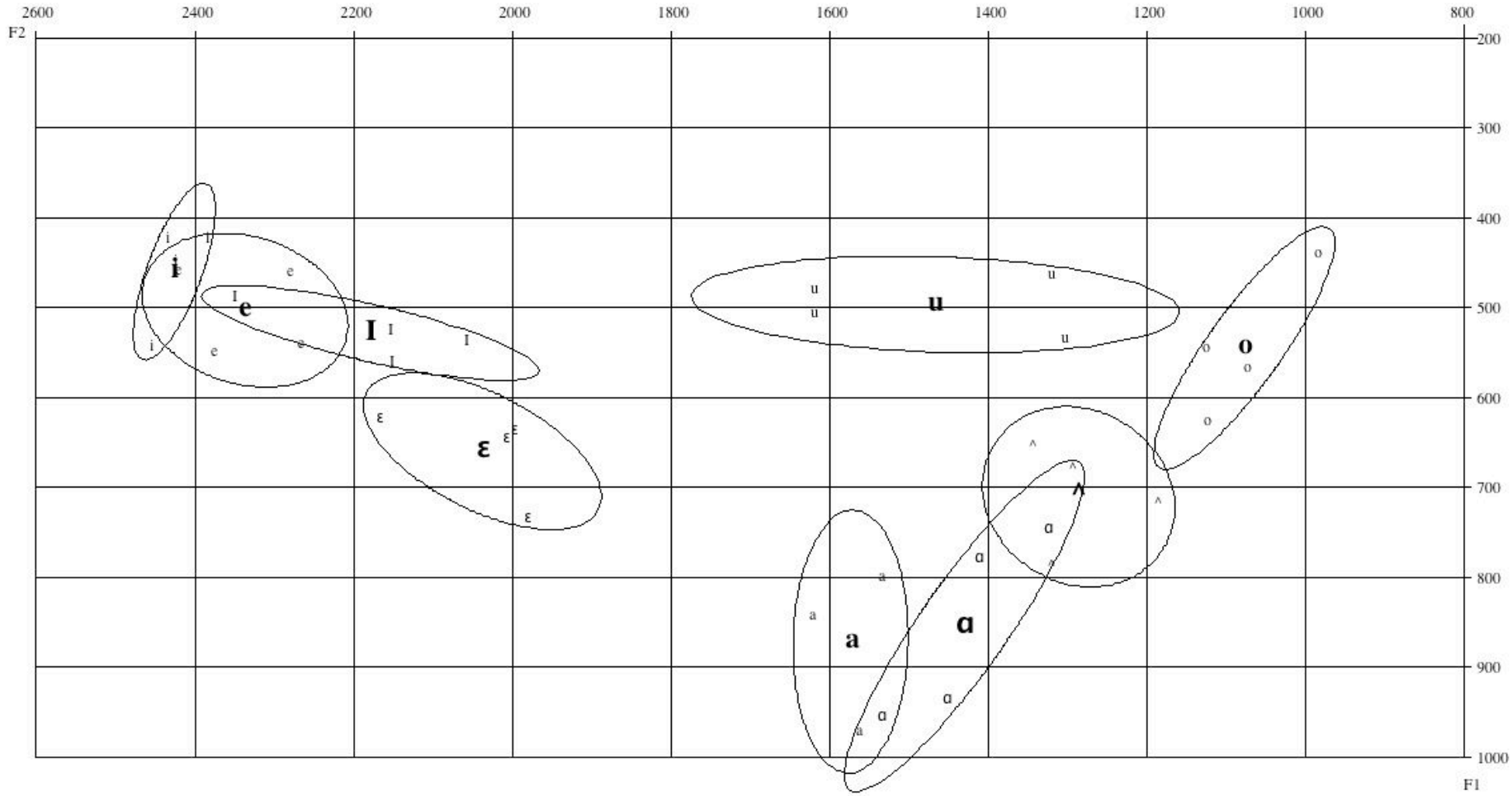


Figure 4.2 – ***The vowel space of Hamilton for monothongs based on collected data***

4.2.3 Paget Farm:

Paget Farm's vowel space, as shown in ***figure 4.3,*** has the same basic relative positions for the front vowels as the other two areas in Bequia. With exception to [i] which, having gone over the data again, appears to be just because of natural differences in length of vocal tract or similar physical criteria for two of the speakers as opposed to an actual difference in the vowel's position in Paget farm compared to either Hamilton or Mount Pleasant.

The relative position of [u] appears to be different in Paget Farm compared to the other areas of Bequia. We will examine this possible variation and the similarities between areas further in section **4.2.4.** Paget Farm's lower vowels correlate with what has been found across the island so far in general, and suggests the [ɑ] can be seen as slightly higher than [a] in BeqC as a whole. As with other areas of BeqC the position of [^] is similar to where it is in other areas, between the [ɑ] and o in terms of height and backness.

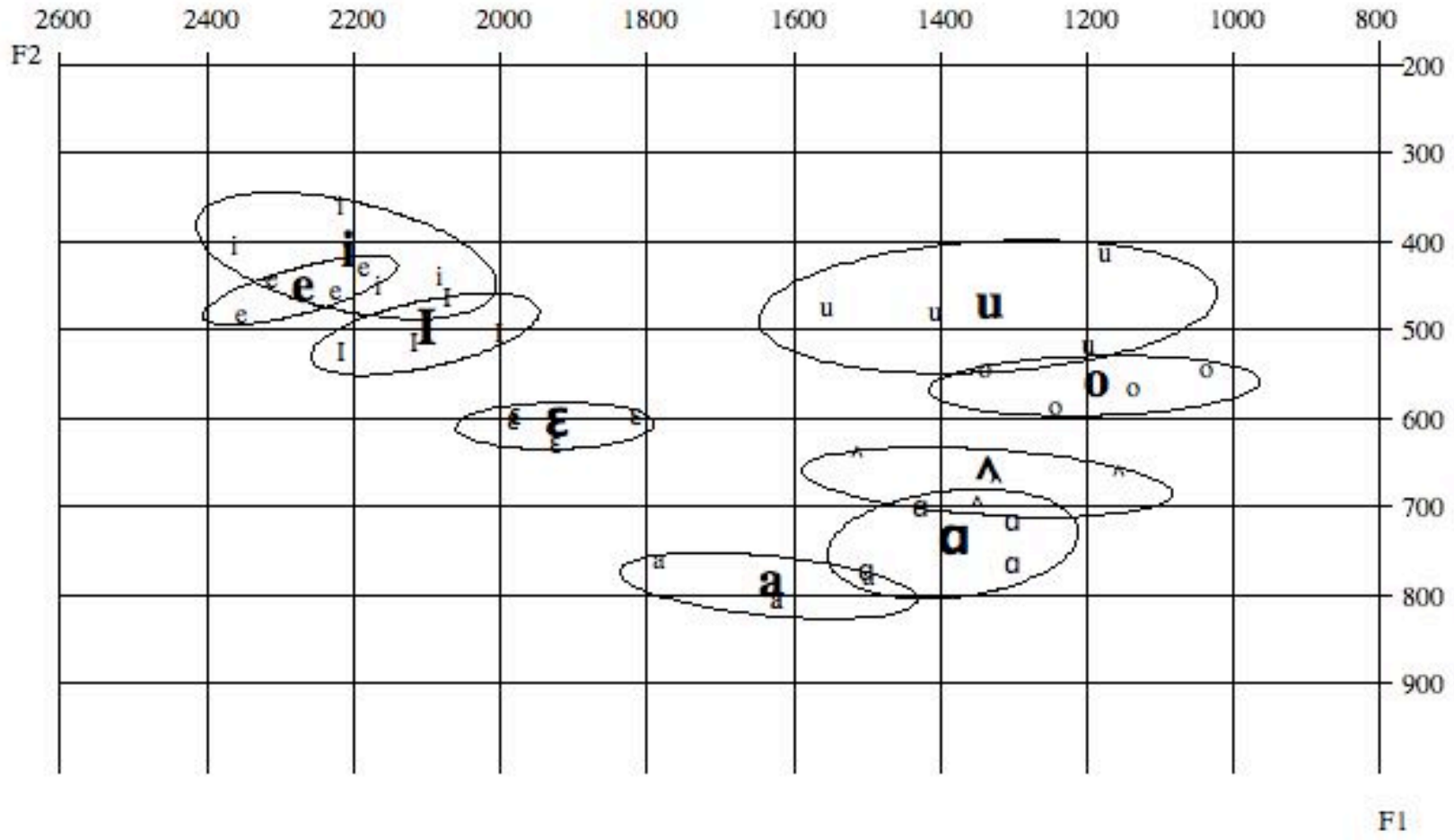


Figure 4.3 – ***The vowel space for monothongs of Paget Farm***

4.2.4 Comparing the vowel spaces of each area

While our study was not geared towards conducting an examination of why speakers feel there is clear variation between areas, our data does allow us to examine whether or not there is actual variation in the vowel spaces of the three areas. It is important to consider this issue before describing the vowel space of Bequia in anymore detail as it will make the difference between whether we should be referring to each area individually or describing the vowel space of the island as a whole.

If variation is occurring what you would expect to see are completely different relative positions of particular vowels in different areas. For example, if variation between vowel spaces across the three areas then you would expect a vowel, such as [i], to appear in a completely different place relative to other areas than before. Therefore if [i] in the Mount Pleasant area was the most fronted vowel and the same finding was found but at a different average F1 and F2 in Paget Farm, you would conclude that the vowel did not vary in terms of movement between areas. As we will discuss during section 5 – this does not prove that speakers from different areas do not distinguish one another by differences related to vowels, it just means that the markers could be prosodic or context-dependant.

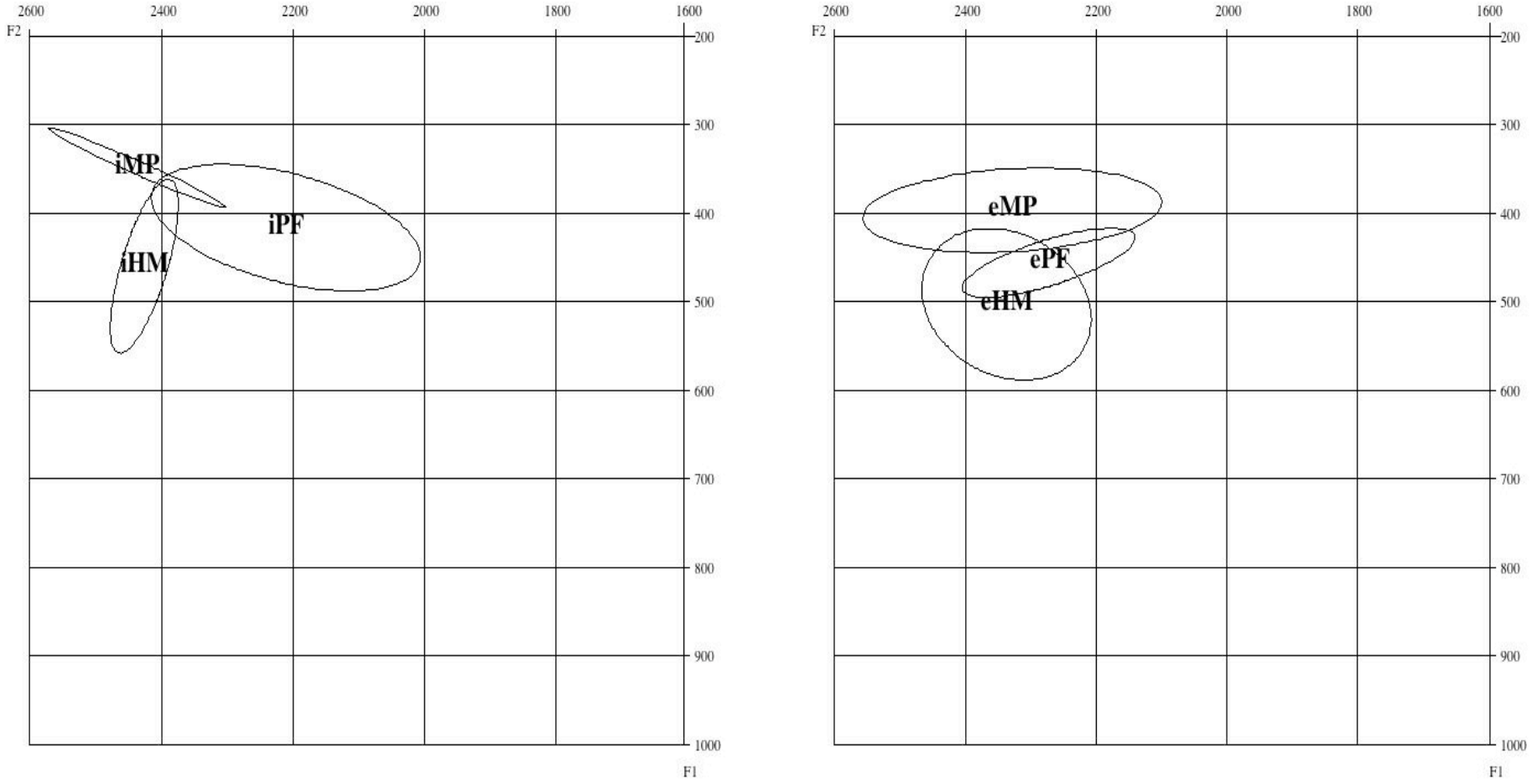
Looking at the vowel spaces together, what ***figures 4.1, 4.2*** **and** ***4.3*** demonstrate about the Mount Pleasant, Hamilton and Paget Farm vowel spaces respectively is that overall there are a lot of similarities worth discussing about the vowel spaces as described above, meaning in general it would be prudent to consider the vowel space of BeqC as one in the same in general. Firstly in terms of front vowels, based on the data available it would appear that the highest vowel in BeqC conforms with many other dialects of English and is [i], followed by [I], [e] and [ɛ] respectively. In general the front vowels as illustrated across speakers in each area show little if any real change in relative position as further illustrated by ***figures 4.4, 4.5, 4.6*** **and** ***4.7***, which show each of the vowels used by area individually. Each figure for the front vowels compared across areas demonstrates how close in each region they are to one

another and the ellipses that surround each vowel as standard for outlying entries in JPlot Formants[3] highlight any overlap between each of the areas vowels.

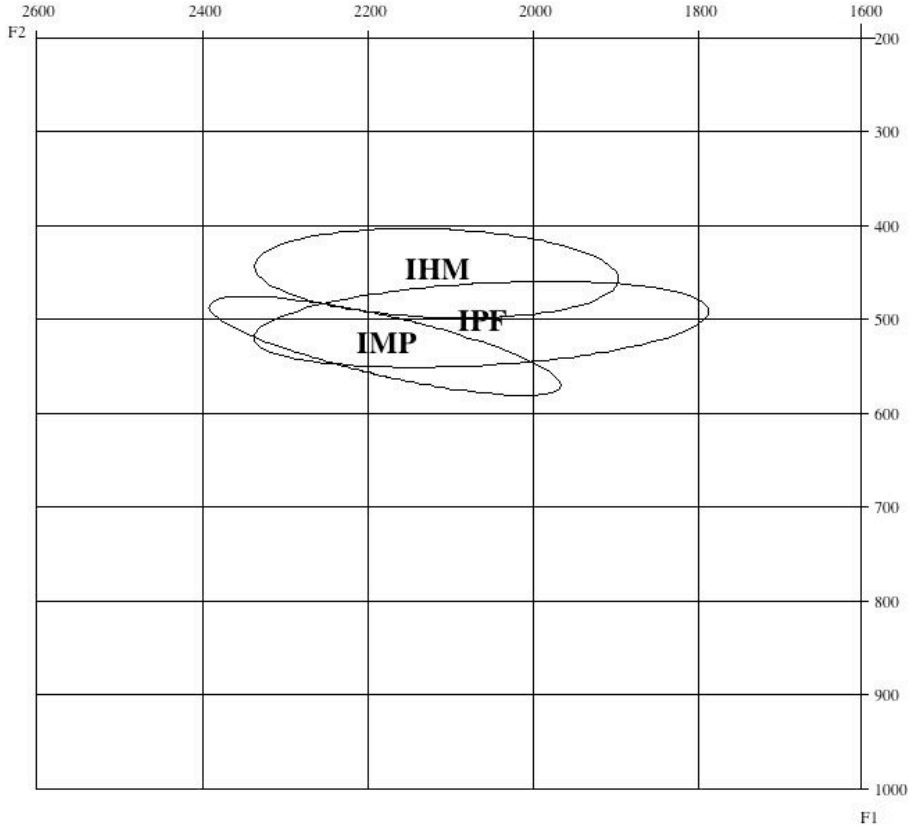
This implies that based on the sample taken that there is no real variation in the position of the front vowels in BeqC between areas outside of normal inter-speaker variation. It is therefore probable that BeqC speakers do not identify one another by how they realize their front vowels. The only vowel that shows a potential change in relative position in BeqC are some of the back vowels such as the [u] vowel as shown from its change in position in each of ***figures 4.1, 4.2*** and ***4.3***. The potential variation shown though could have a series of explanations that are not related to variation though. Although our analysis implies a difference between areas based on listening to the data it is our belief that these irregularities are due to the sample size.

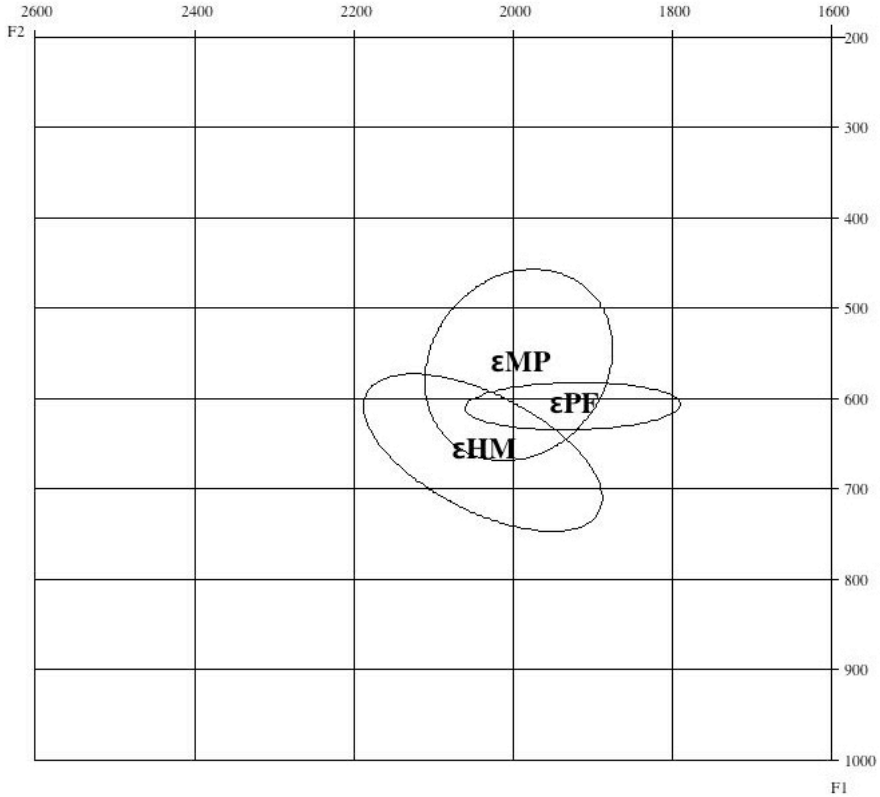
Running a MANOVA across the three areas as the independent variable and F1 and F2 values as dependent variables for [u] suggests a statistically significant difference between their points. Had more time been available we would have also examined the F3s of the outlying speakers to see if they were similar or not. If they are similar then any variation in the formants is not due to vocal tract length, and a re-examination of the data is called for.

[3] http://www.linguistics.ucla.edu/people/grads/billerey/PlotFrog.htm



Figures 4.4 and 4.5 – ***[i] and [e] across each area (MP – Mount Pleasant, HM – Hamilton, PF – Paget Farm)***





Figures 4.6 and 4.7 – ***[I] and [ε] across each area (MP – Mount Pleasant, HM – Hamilton, PF – Paget Farm)***

This is particularly the case for Paget Farm where there are not two distinct groups of speakers, but just one or two outliers who skew the averages. When we discuss outliers within a sample so small it is likely that outliers are more a result of inter-speaker variation than anything else. Had we more data from Hamilton and Paget Farm we could build a better picture of the vowel space by sampling a minimum of four more speakers from the area to see where their [u] vowel was placed. If the split between positions of [u] were maintained then a further analysis would be needed to understand why – otherwise ,if the majority of the data clustered towards one of the two positions, then a brief examination of why the outliers existed would be merited. This is supported by the feelings of the experimenter, as we will discuss in section **5.1**, as additionally when listening to the tokens, there appears to be no noticeable difference between the [u] in different areas audibly. To summarize the differences discussed we have put all three [u]'s from each area together in ***figure 4.8*.**

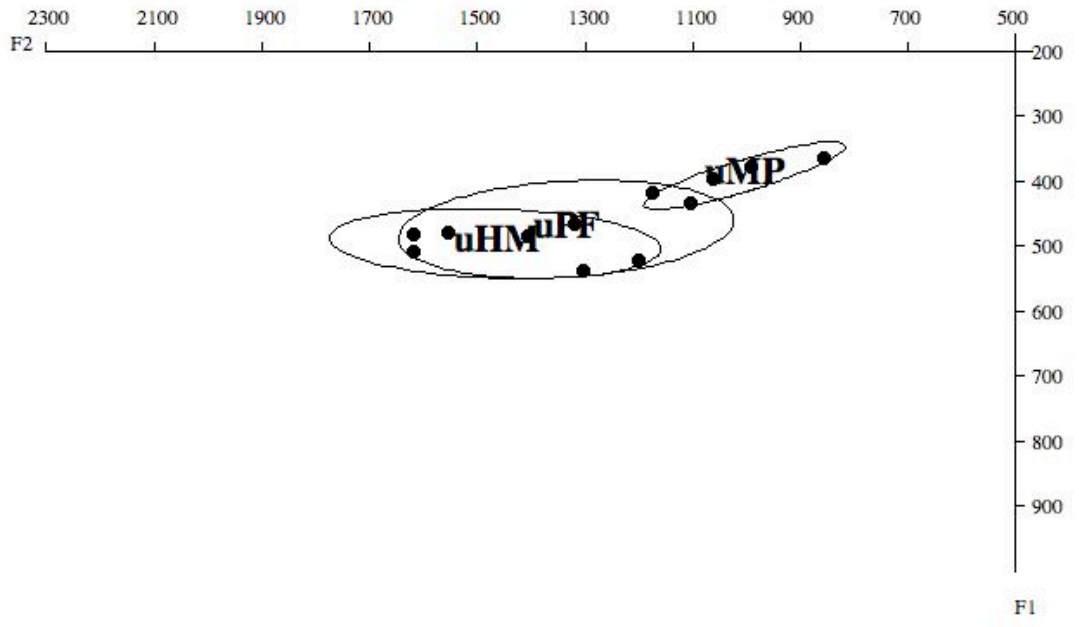


Figure 4.8 - ***Differences in the articulation of [u] across the three areas of Bequia.***

If there is a phonetic distinction for speakers from different areas in BeqC's vowel space then it does not seem likely to be because of variation in monothongs although a more in depth statistical analysis is required based on our findings with [u]. We will

continue to examine any potential variations in the vowel space in **4.3** where we examine diphthongs in BeqC and then discuss further in section **5.1.**

One thing that all the charts seem to indicate though of interest relates to the contrasts between low vowels as presented the on the vowel plots above. Each plot demonstrates that there appears to be a single centralized low vowel given the way [a] and [ɑ] are distributed closely together centrally – particularly in the case of Mount Pleasant. The implication from this is that they may be the same phoneme with two different realizations, meaning that there is just one low vowel in BeqC, or that the two phonemes are very similar and the [ɑ] is raised above and slightly further back than [a]. To test for this we performed an unpaired t-test on the data available across speakers to establish if the difference between the F2 values for [a] and [ɑ] was significant between speakers in each area or not as if they are in the same basic F2 position as one another there is a case to be made that they may be just different realizations of the same phoneme varied by height. The results for each speaker group suggest so far that there is in general a statistically significant difference between the two groups of formants with exception to Mount Pleasant. We found the two-tailed P values for each of 0.4812, 0.0191 and 0.0168 for Mount Pleasant, Hamilton and Paget Farm respectively. These were based on 6 degrees of freedom and t-values for each of the areas with t-values of 0.7507, 3.178 and 3.2796. While the second formants of Mount Pleasant's two vowels are considered to be not statistically different, based on no acoustic difference between the areas as well as the widely spread results from Mount Pleasant it is worth considering if a sample of 8 speakers would demonstrate a statistically significant difference between areas.

Examining the height of the two phonemes by comparing F1s in an unpaired t-test reveals similar findings. Worth noting is again that Mount Pleasant's [a] and [ɑ] are considered to be not statistically significant with a p-value of 0.1475 based on six degrees of freedom and a t-value of 1.6626. This suggests that the two phonemes are extremely similar terms of height and how front/back they are.

Based on available evidence in terms of how the phonemes are used on Bequia the implication is that [a] and [ɑ] are two separate vowels as opposed to different realizations of the same phoneme. It should be stressed that the best way to be sure of this though would be to acquire more tokens of [a] and [ɑ] from speakers on Bequia

then to perform more statistical tests to verify if this is the case. While the t-test suggests the two may be similar based on the initial sample it is worth noting that there is no audible similarity between tokens here too. **Figure 4.9** ("*cat*" compared to "*cart*") shows spectrograms of the two vowels from Mount Pleasant speakers collected while in Bequia. While there is a degree of similarity between the two – the vowel in "*cat*" appears to be transitioning downwards before the [t], this is not the case for "*cart*". It is also worth noting that all the words gathered for [ar] are using [ɹ] following the vowel, or should be. You can see in **figure 4.9** that there appears to be no [ɹ] present though, suggesting this speaker is non-rhotic. We will go into more detail about the status of rhoticity in BeqC during our analysis of BeqC's consonants.

As touched on briefly before, there is possibly an extra monothong vowel that we were unable to collect due to circumstances related to the literacy rate of participants. Although we only have incidental evidence at present we believe speakers have a vowel like [ɔ] such as can be found in words such as "*flog*", "*dog*" and "*cog*". Unfortunately due to the removal of the word card element of the elicitation task (discussed in section **5.4**) we were unable to gather enough of a selection of tokens from speakers to support claims that this vowel exists. We did however gather examples of "*door*", "*horn"* and "*corn*" – however each of these appear to be a potentially unaccounted for diphthong rather than a monothong, as each of them seems to indicate a diphthong – we will discuss this subject further in **4.3**.

The [ɔ] vowel is therefore as of yet unattested in BeqC as acoustic evidence of it was not acquired. This is similar to VinC where according to the work charting one speaker's vowel space on Saint Vincent by Prescod (2004), where it is also unattested. A more thorough analysis of available corpus data is needed to establish if this monothong is present in BeqC or not.

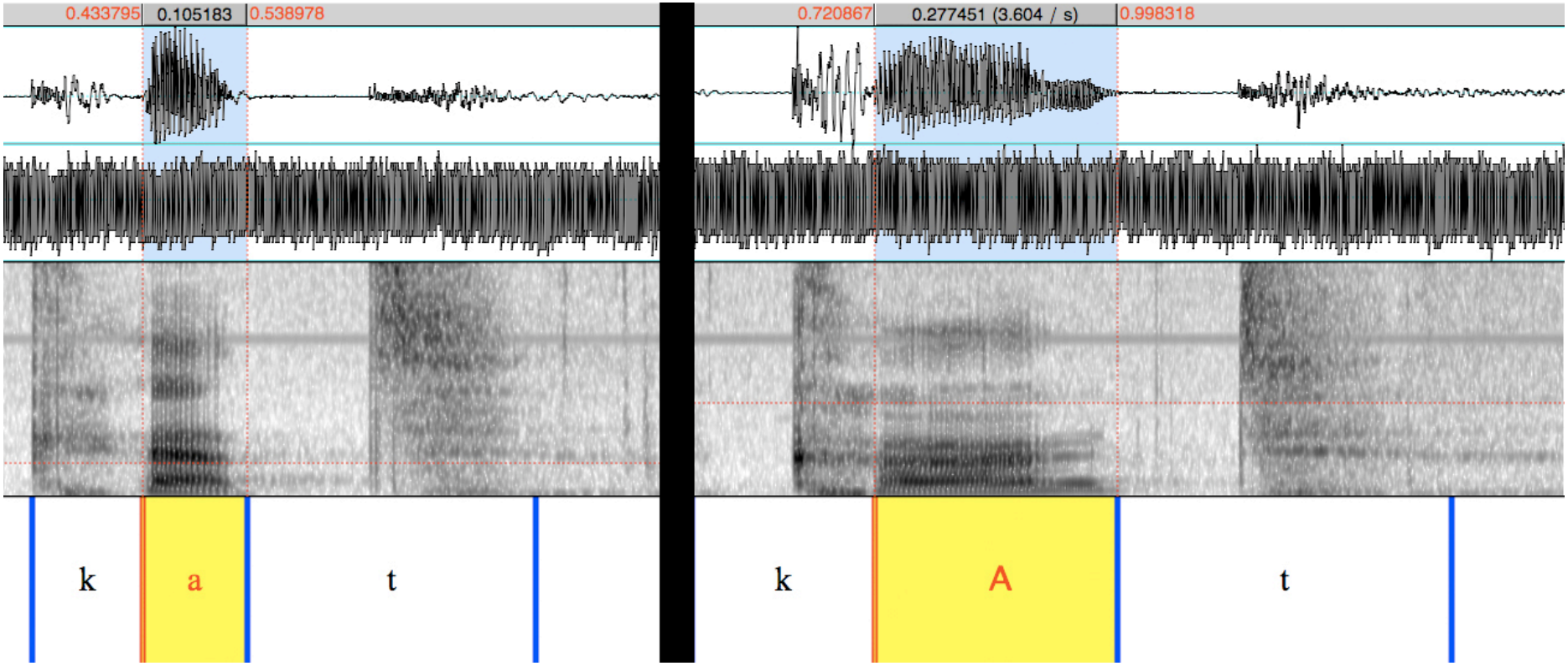


Figure 4.9 -*"cat" compared to "cart" in BeqC.*

While going through the Bequia corpus to form our hypothesized phonemic inventory we came across what appeared to be a vowel-lengthening phenomenon. This appeared to be as speakers seemed to use the same vowel for words that in RP English would use different vowels such as "*ban*" and "*barn*" as shown in **figures 4.10** ("*ban*") and **4.11** ("*born*"). Here you can see one case where the same vowel appears to be used upon listening to them but the spectrogram shows a longer vowel for "*born*" than in "*ban*".

The main example of this we used to try to capture this difference during our data collection on Bequia was "*hat*" and "*heart*". What was expected to happen based on evidence in the Bequia corpus of words line "*ban*" and "*born*" was that the two words would use the same vowel but the vowel in "*heart*" would be longer. However upon comparison in BeqC unlike perhaps other surrounding islands speakers here use two separate vowels to differentiate as opposed to lengthening, which may be a result of [ɹ] being present following the vowel in "*heart*". During a brief re-examination of the corpus data we found other words that had a similar effect such as "*ban*"/"*born*" and "*hear*"/"*here*" which both show the same signs of a lengthened vowel for one of the two words to show a difference however we were unable to collect enough tokens of to measure the durational differences to see if there was a salient and consistent difference or not between the two vowel lengths. While we did observe evidence of this within the Bequia corpus as mentioned before – they were taken from different environments and with different preceding and following words. This would make any comparison of their durational differences counter-productive due to other factors that may have affected the length of the vowels in the surrounding phonetic environment.

Overall based on available evidence residents of the key areas of Bequia do not appear to vary how they realize their monothongal vowels based on area and we have looked at the similarities between areas as a result. We will discuss this as well as further ways of testing if speakers are using either phonetic realizations or prosodic features to show which area of the island they come from in section **5.1**

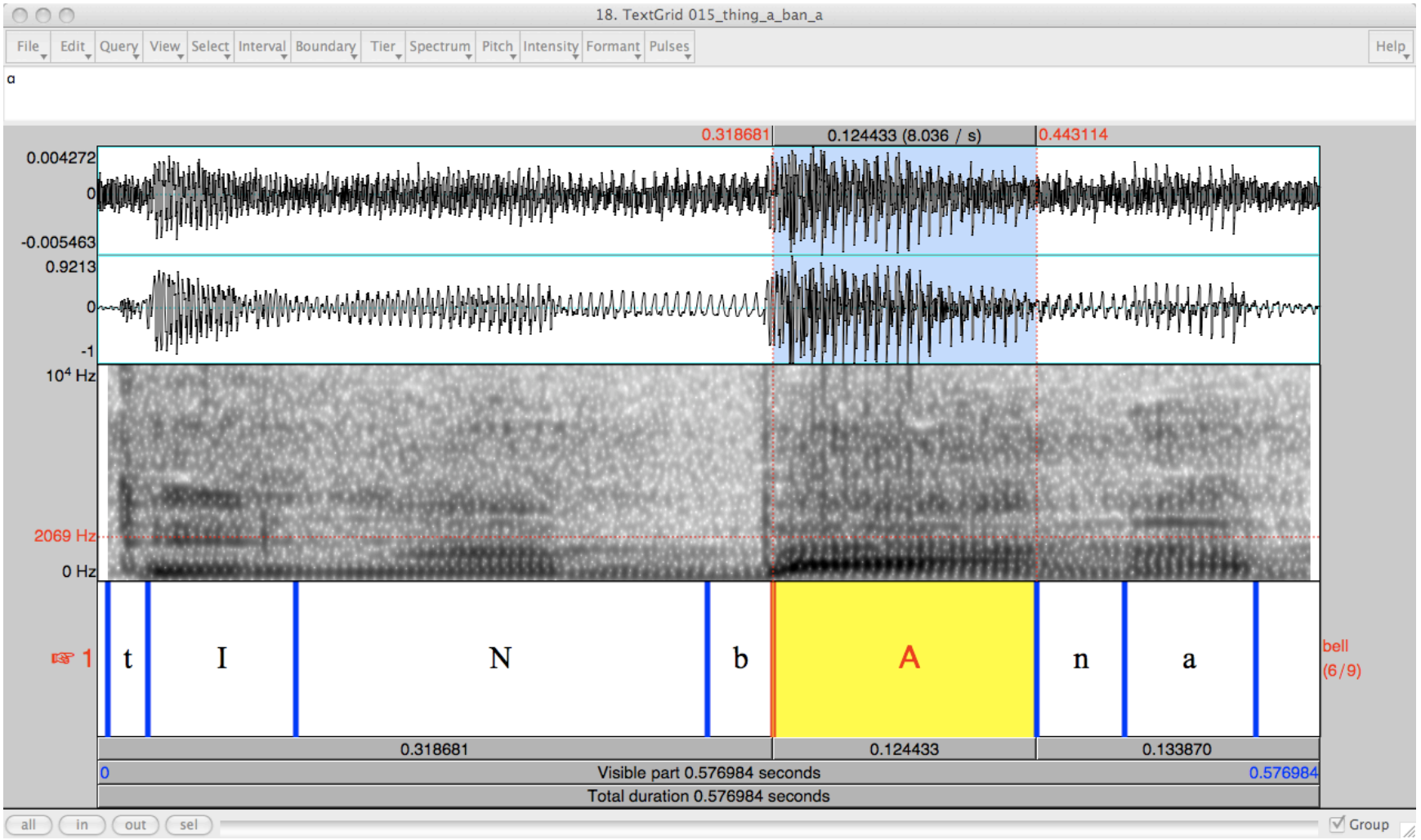


Figure 4.10 – *"ban" from a Mount Pleasant speaker from the Bequia corpus*

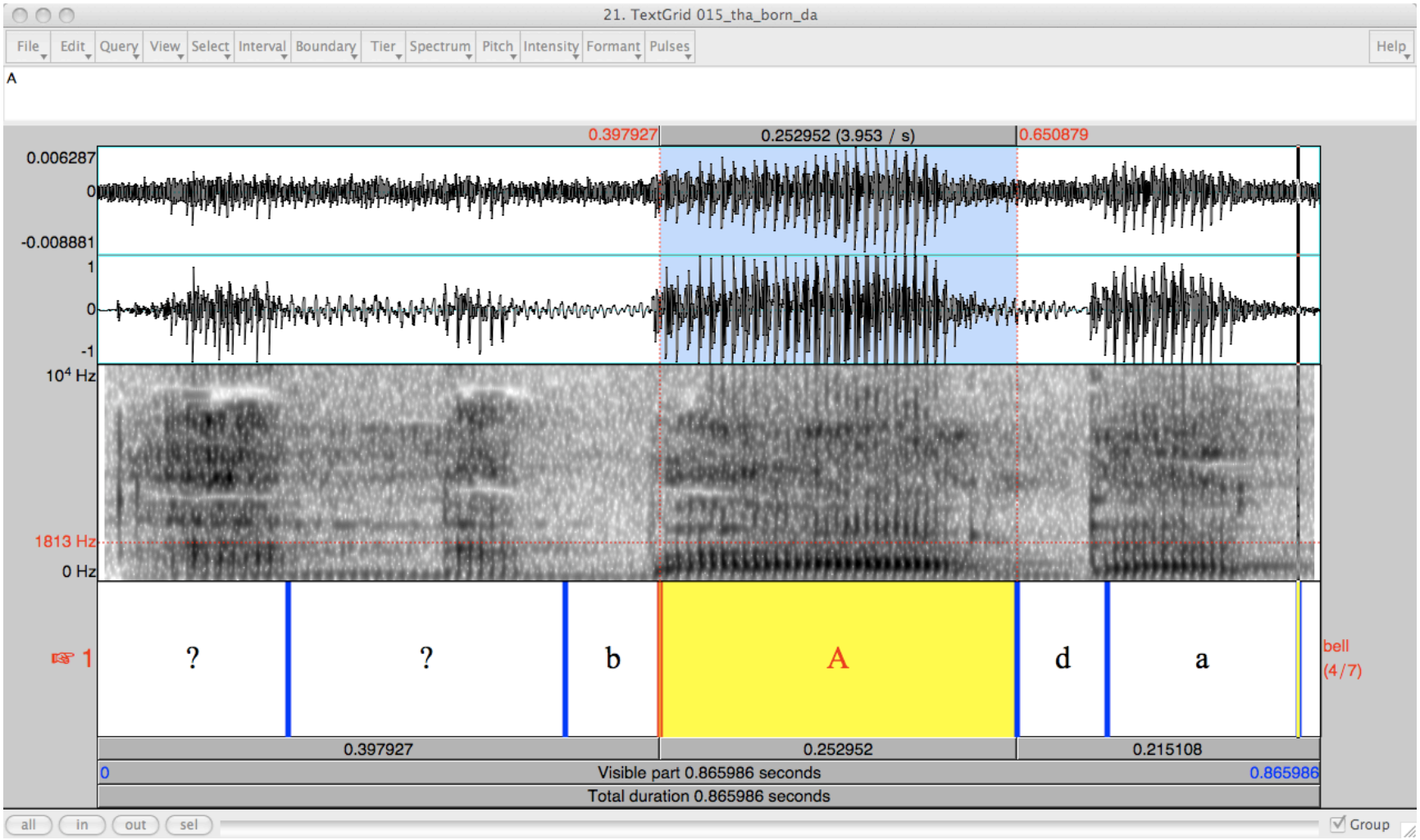


Figure 4.11 – *"born" from a Mount Pleasant speaker from the Bequia corpus*

4.3 Diphthongs in BeqC based on picture card data

Conventionally many sociophoneticians represent their diphthongs as a mark at the start point then an arrow showing the progression to the final point, ignoring how the diphthong looks at the mid-point. This means that the transition between the start to the end point of a diphthong can be over-simplified. Often at the midpoint of the diphthong during the transition the formants are not on a direct straight line towards the end points formants. Therefore to represent diphthongs from different areas of Bequia we have chosen to represent diphthongs as three points on a graph: 50 milliseconds from the start of the vowel to avoid any effect preceding segments may have on the diphthong (***xx1***), the central point of the vowel (***xx2***) and 50 milliseconds from the end (***xx3***). This will allow us to view a good summary of the formant trajectory for each of the three main diphthongs.

Looking at each diphthong by area, ***figures 4.12, 4.13*** and ***4.14*** shows [ai] in Mount Pleasant, Hamilton and Paget Farm respectively. Each of the relative positions at the start, mid and end points for the diphthong are the same for all intents and purposes – namely in the figures they look the same positions relatively and when listening to the files they also do not sound different between areas. This would strongly suggest that [ai] does not vary between speaker groups on the island and it demonstrates a relatively straight progression from near an [a] start to finishing closer to [i] as we will discuss shortly.

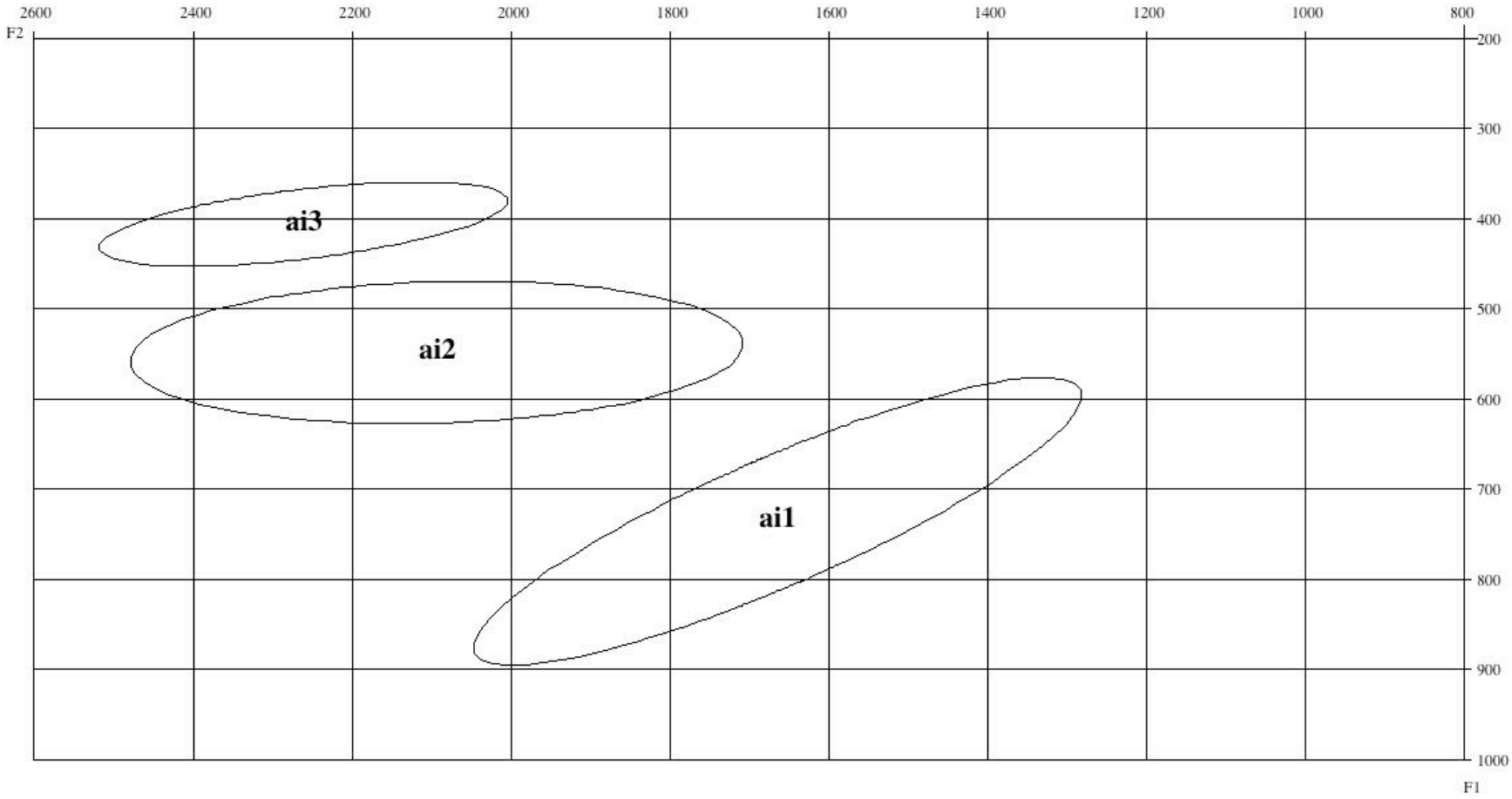


Figure 4.12 – ***Formant trajectory for [ai] from the sample of Mount Pleasant speakers***

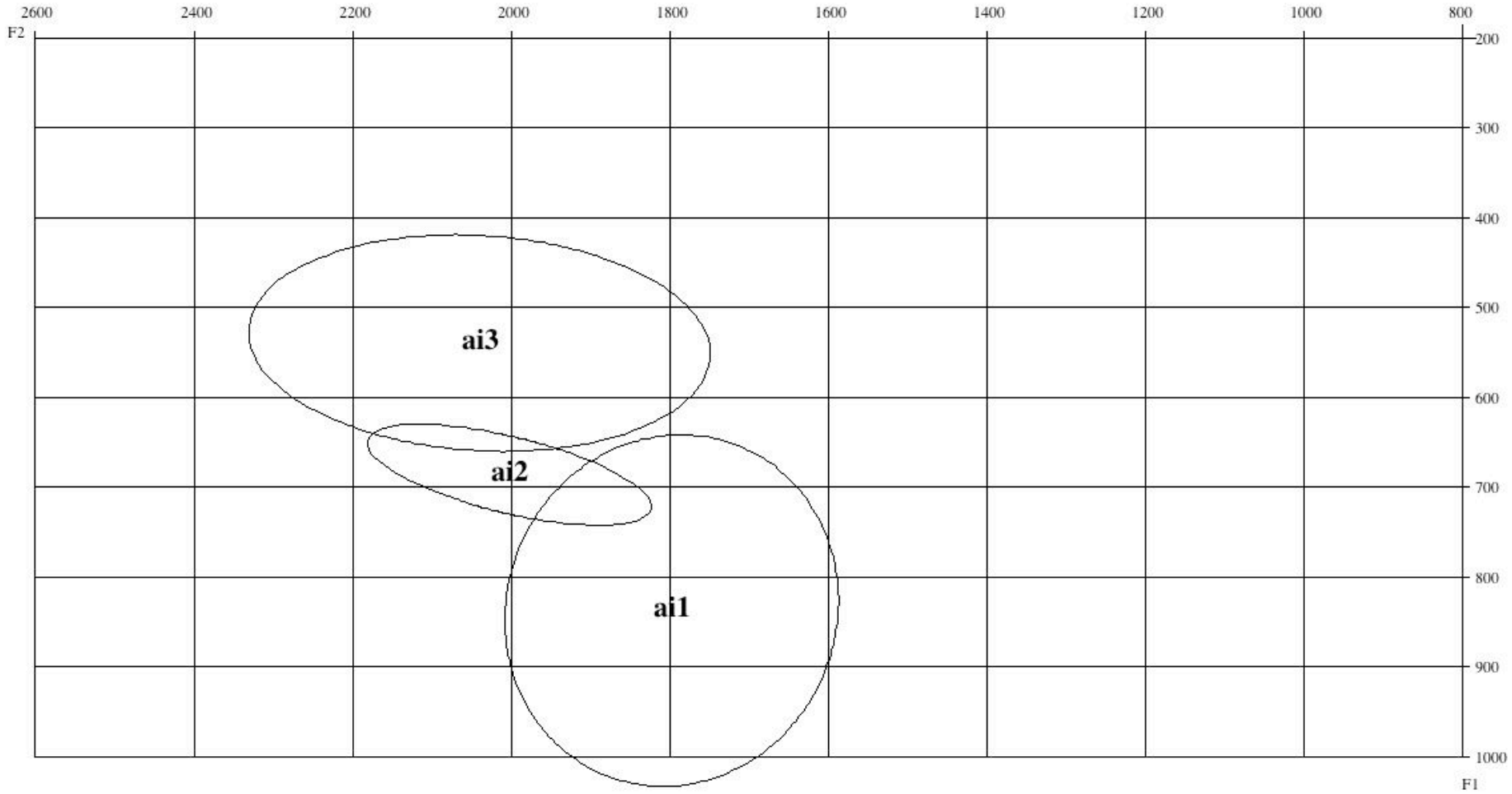


Figure 4.13 – ***Formant trajectory for [ai] from the sample of Hamilton speakers.***

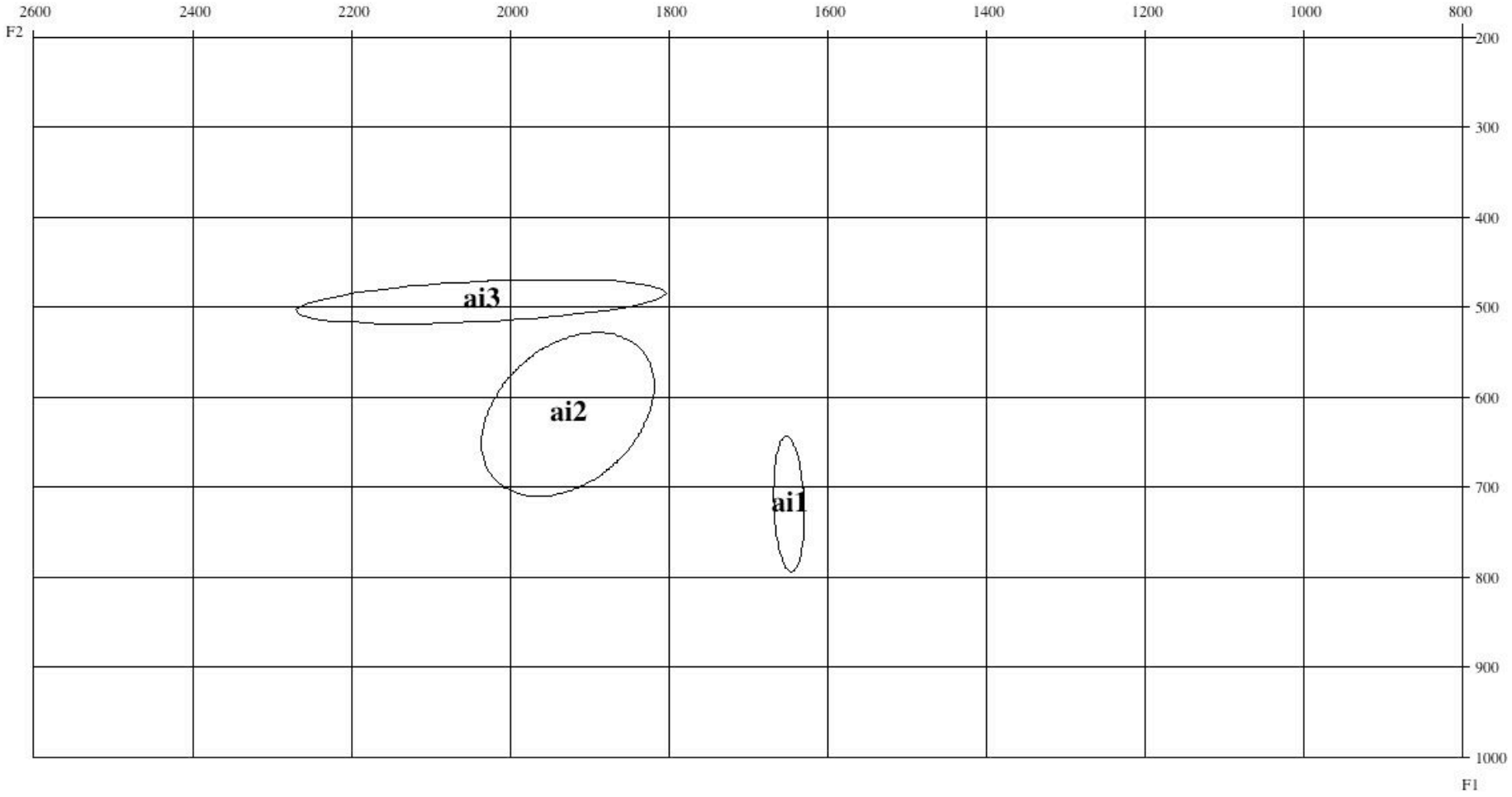


Figure 4.14 – ***Formant trajectory for [ai] from the sample of Paget Farm speakers.***

Figures 4.15, 4.16 and ***4.17*** show the formant trajectories for [ɔi] of Mount Pleasant, Hamilton and Paget Farm in detail. As you can see the diphthong starts out relatively far back then by the mid-point has moved forward and by the end in general it has risen towards where one would expect the monothong [i] to appear. Without a chart showing the mid-point as well as just the start and end such transitions during the diphthong would be ignored. Once again the relative positions of [ɔi] are basically the same when averaged out across speakers except Paget Farm, which for the mid-point seems to have a higher initial point than the other two areas. This is likely due to the proximity of F1 and F2 for a large part of the diphthong, making a reading of F1 hard to make especially given the slightly worse audio quality of some of the tokens in question as opposed to signs of actual phonetic variation in Paget Farm. Again a larger sample recorded in a good audio environment would help to clarify this apparent inconsistency.

Figures 4.18, 4.19 and ***4.20*** shows the formant trajectories for [ɔu] across the areas of Bequia (Mount Pleasant, Hamilton and Paget Farm). Each speaker group has the same general curve from the starting point that moves backwards and up initially before rising as well as moving a bit forwards at the end of the diphthong. Like the other two diphthongs the relative position of the points stays the same, as does the actual trajectory of the diphthong as it goes from start to finish.

Looking at the results of the diphthongs we can see that as stated individually, the speakers across all three areas on Bequia are using the same diphthongs, matching what was observed in general for the monothongs. This does not rule out the use of any phonological features or realizational features to differentiate one area's speakers from another. What the evidence provided so far does prove as a whole is that speakers across areas use the same vowels realized in the same relative positions for monothongs and diphthongs. Among the other possibilities for what phonological factors, if any, allow residents of Bequia to identify different speakers from different areas we will examine the concept of word stress and the duration of certain segments across speakers of BeqC in section **5.1.**

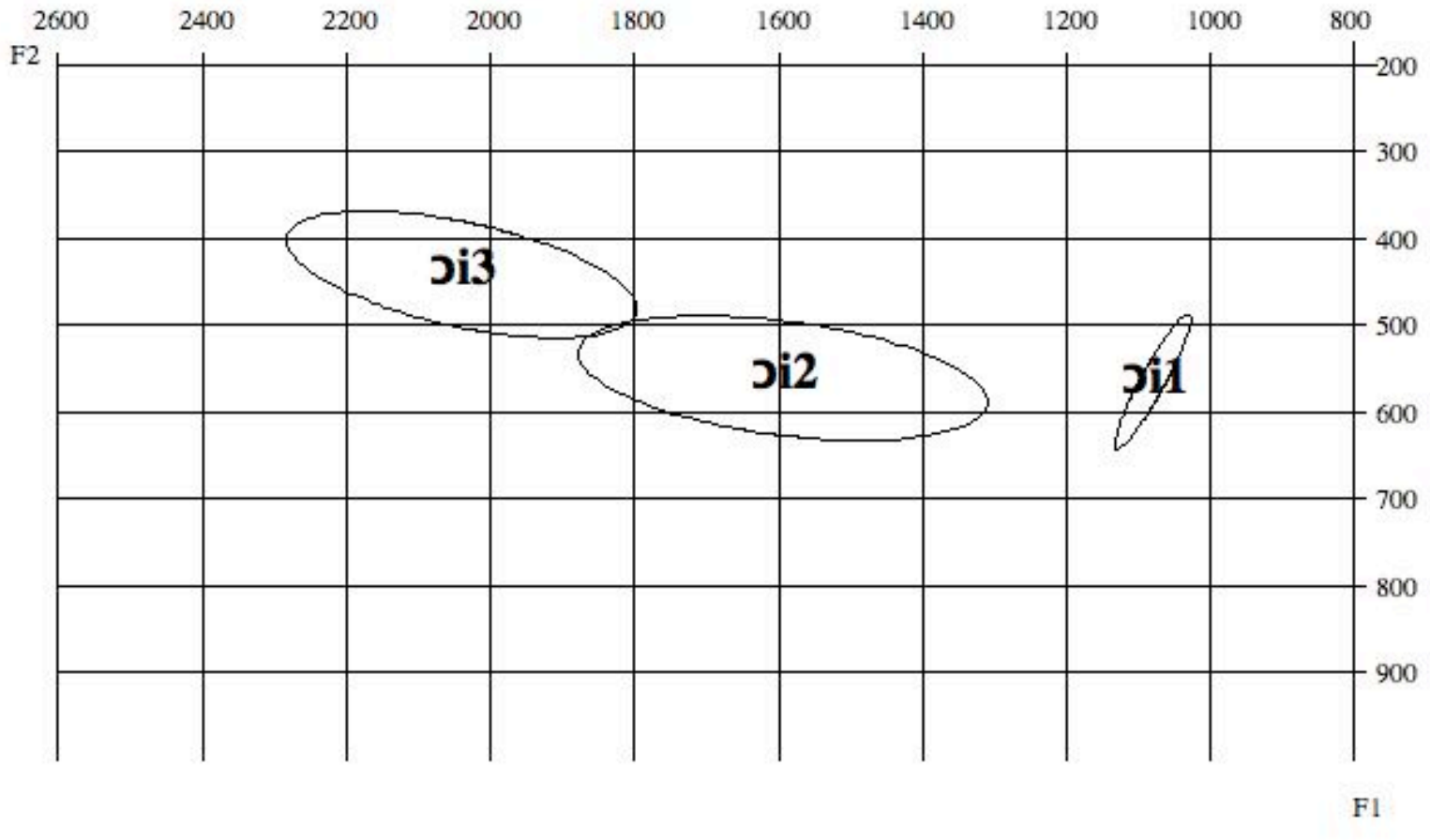


Figure 4.15 – ***Formant trajectory for [ɔi] from the sample of Mount Pleasant speakers***

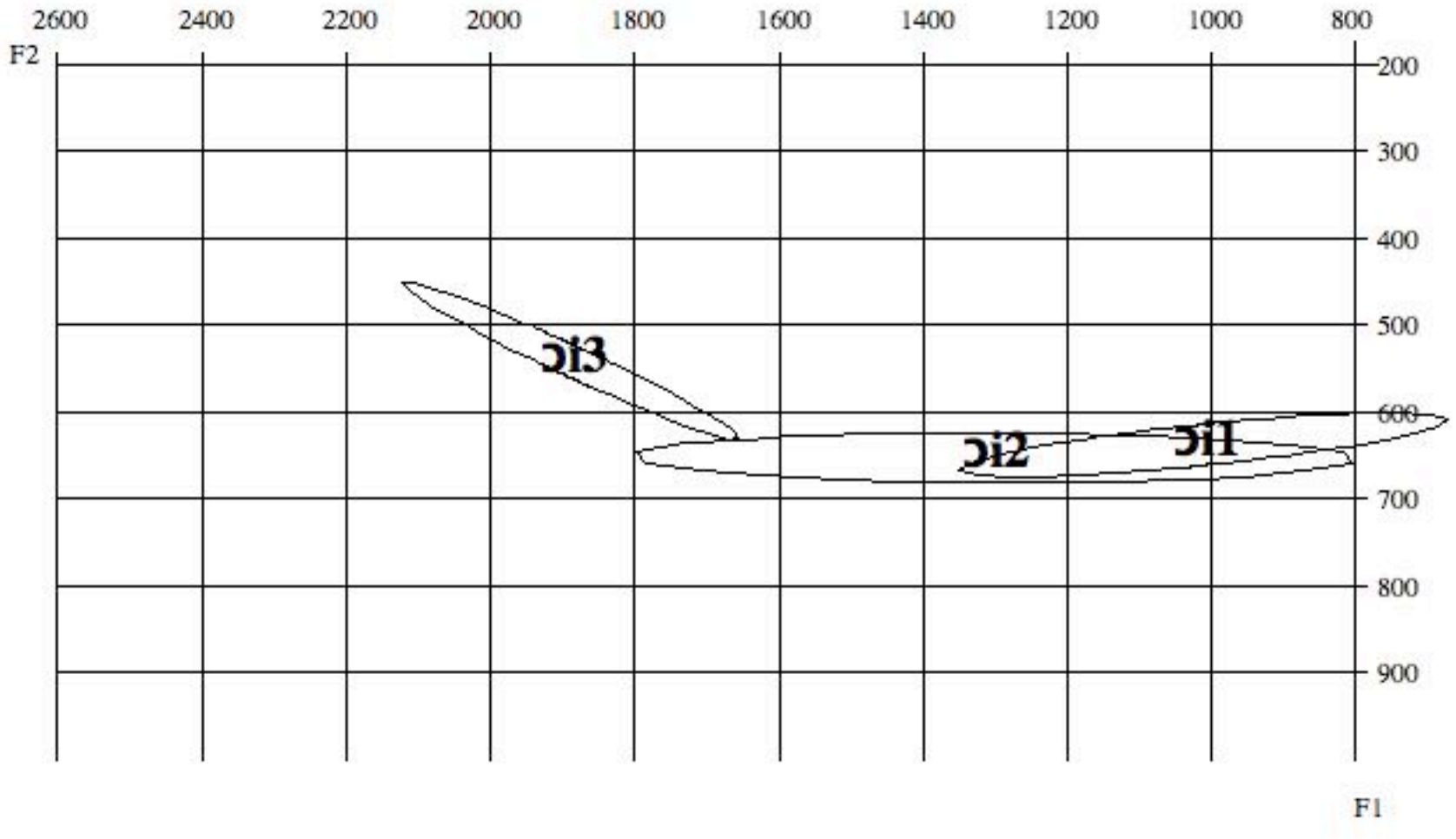


Figure 4.16 – ***Formant trajectory for [ɔi] from the sample of Hamilton speakers.***

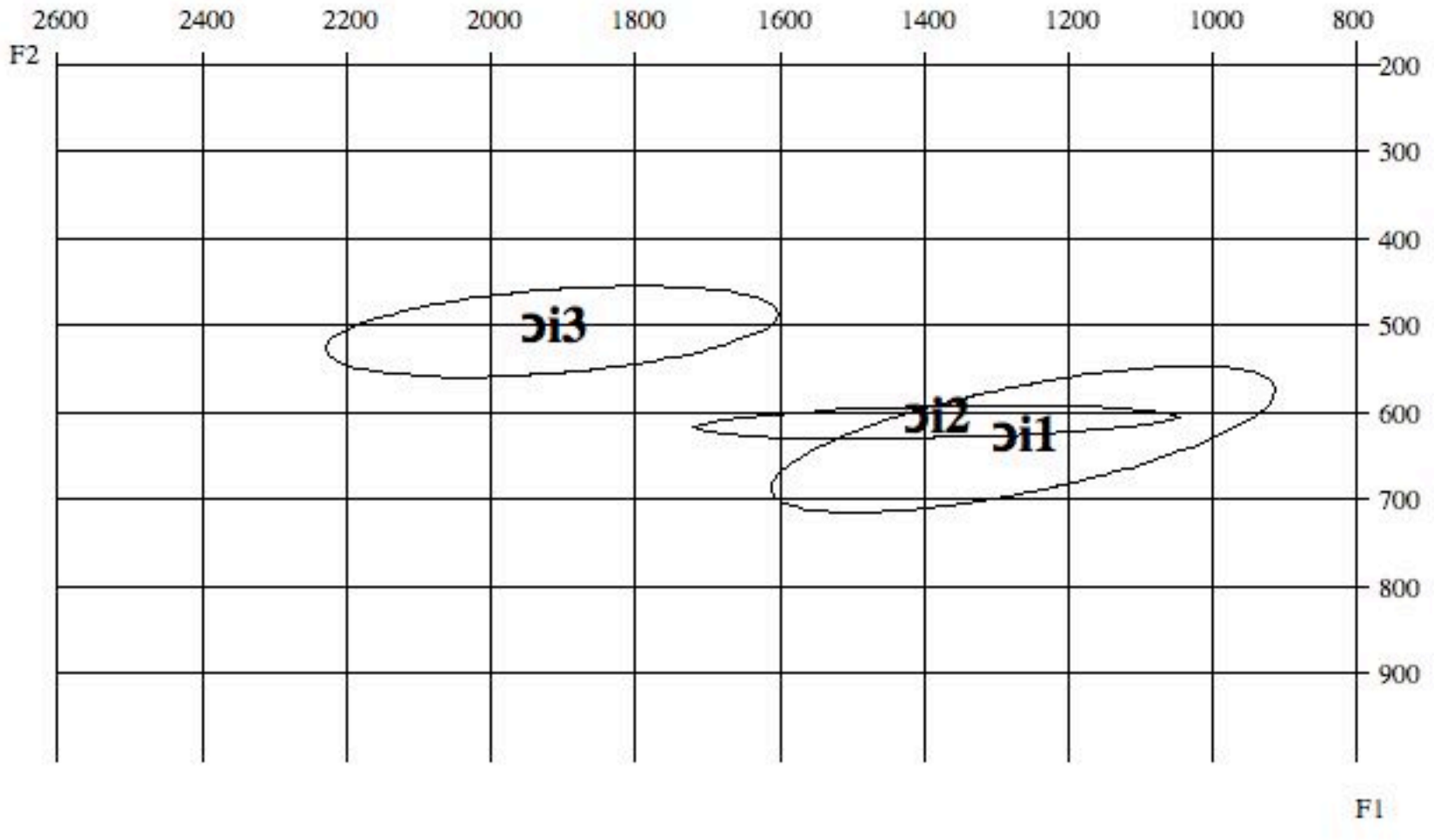


Figure 4.17 – ***Formant trajectory of [ɔi] from the sample of Paget Farm speakers***

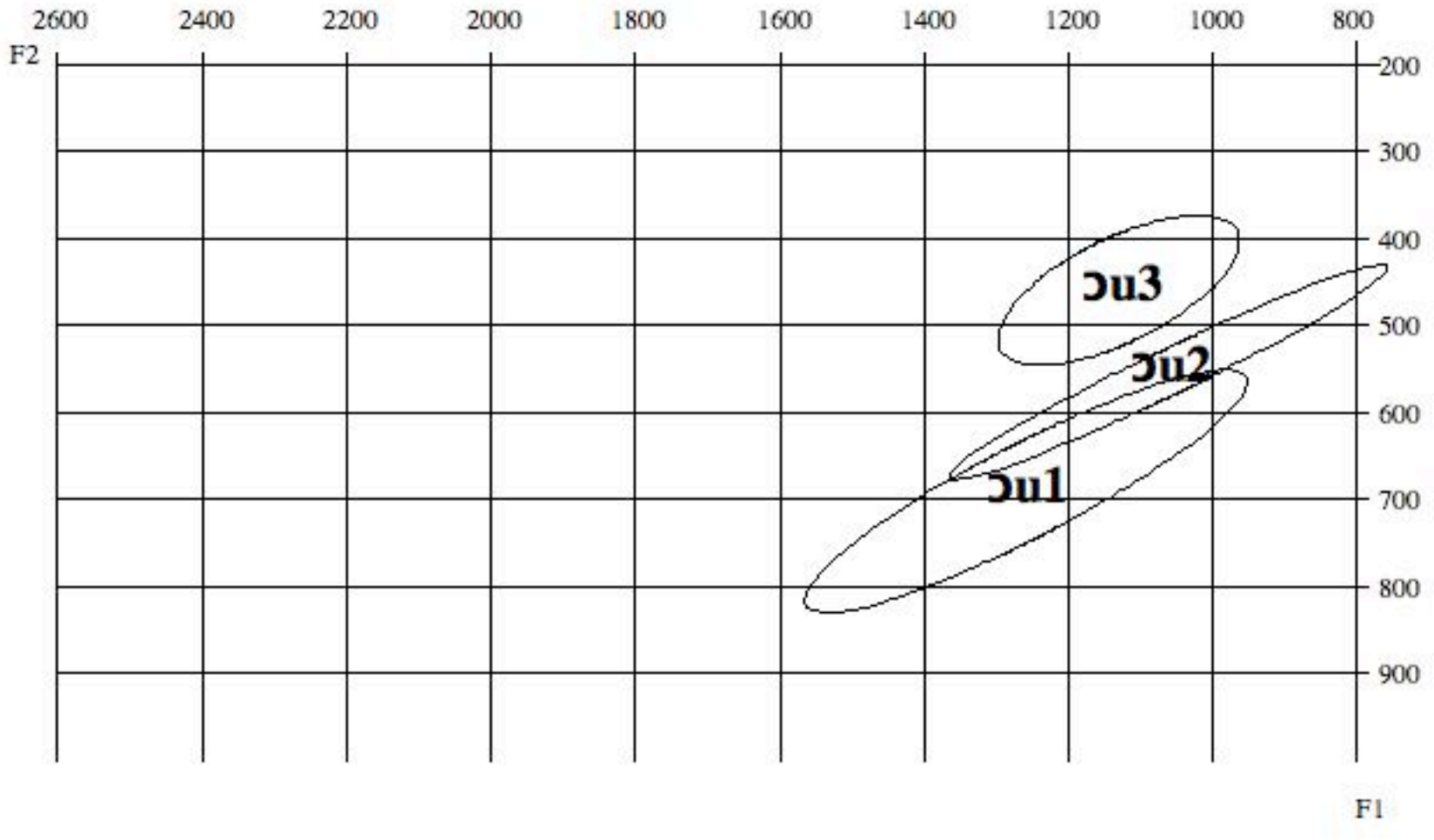


Figure 4.18 – ***Formant trajectory for [ɔu] for the sample of Mount Pleasant speakers.***

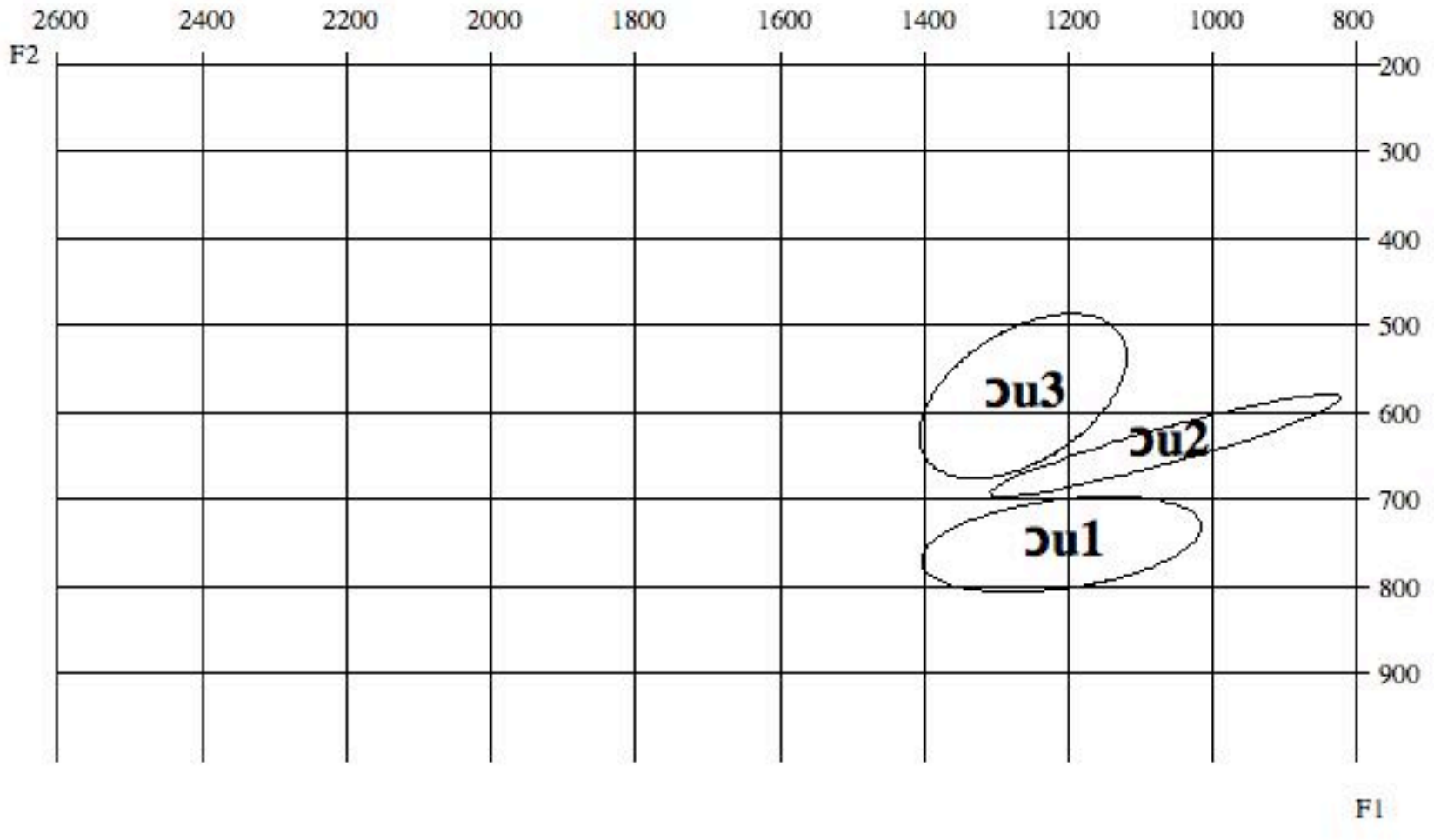


Figure 4.19 – ***Formant trajectories for [ɔu] from the sample of Hamilton speakers.***

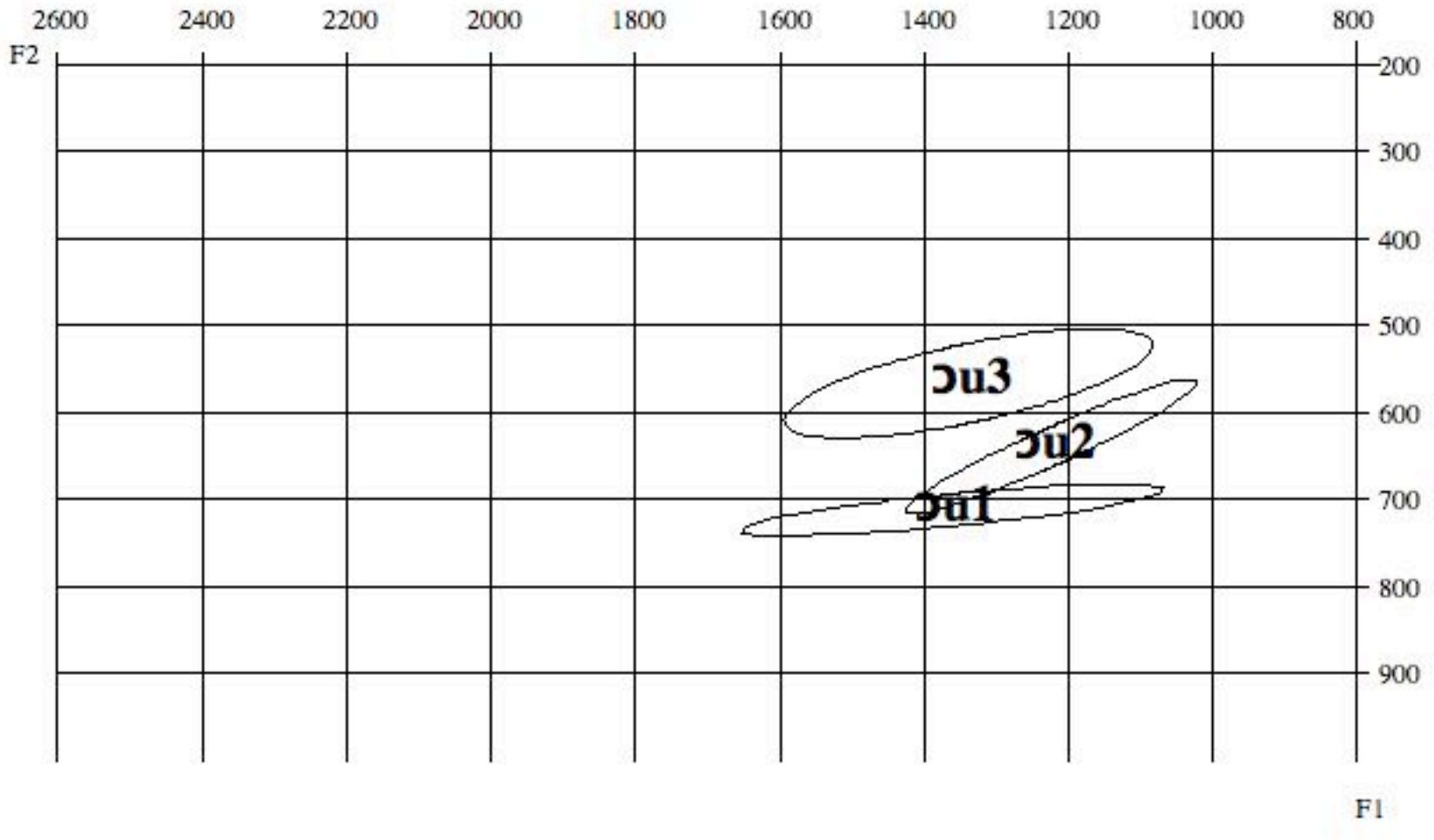


Figure 4.20 – ***Formant trajectory for [ɔu] from the sample of Paget Farm speakers***

Looking at the final point of each diphthong – a valid question is do the end-points of each area's diphthongs vary? To address this question we ran the results of each diphthong's F1 and F2 as dependent variables with the areas as the independent variable for three MANOVAs as shown in **appendix 2.** Results demonstrated a significant difference in the end points for [ai] and [ɔi] by area while [ɔu] did not show a significant difference. Given the outlying results in the two diphthongs that show significant difference we should be apprehensive about declaring it an actual source of variation. As [ɔi] does not show significant variation a larger sample of each diphthong should be gathered and more statistical test ran before this question is answerable in full.

With regards to the extra potential monothong we discussed, while due to the data we lack enough tokens to prove exactly where the vowel is – we decided to take one area, in this case Mount Pleasant and analyze the three potential diphthongized tokens that use [au] to see if there is evidence to support another diphthong in BeqC or not. As **figure 4.21** shows, the speakers of BeqC appear to have an extra diphthong not noted particularly until now. Looking at the start and end points of the diphthong, it does not conclusively suggest that there is a missing single monothong [ɔ] in BeqC based on the vowels starting point, which is close to where [o] is in Mount Pleasant speakers based on its position.

As both [ai] and [ɔi] theoretically should have approximately the same ending position, based on the fact they end with the same vowel, ***figure 4.22, 4.23*** and ***4.24*** shows the final points of [ai]/[i] and [ɔi]/[i] per area. After performing MANOVAs using dependent variables of F1 and F2 with an independent variale of the different areas though our results showed otherwise. Statistically each area except Hamilton in both cases were shown to have a significant difference between the end points of the diphthongs and the [i] vowel. This may be due to the data for Hamilton being harder to interpret thus creating several outliers. The full multivariate analysis results performed by area are available in **appendix 2** for each of the statistics discussed regarding diphthongs. The low number of samples between areas though reduces the chances of accurately establishing if there is an attested difference even if statistics suggest there is one.

Both [ɔi] and [ɔu] have been marked at present as starting with the same phoneme, which doesn't match any presently attested in BeqC. As a result of this we decided to check if there was a significant difference between the two diphthongs and the monothong [o]. Figures ***4.25, 4.26*** and ***4.27*** demonstrate the initial positions for each of the three vowels across each of the three areas (Mount Pleasant, Hamilton and Paget Farm). Again performing MANOVAs using the same criteria as for [ai], [ɔi]/[i] we examined the start points of the two diphthongs against [o]. Our results in **appendix 2** show that across the board the start point of [ɔi] did not have a statistically significant difference in position to [o] while [ɔu] did. While this does not prove that [ɔi] and [o] share the same start point it does merit further investigation into if [ɔu] is actually closer to the potentially missed monothong [ɔ]. Without firm proof of the monothong [ɔ] such a claim is unattested though, as we lack tokens showing the position of [ɔ] for speakers on the island. Without such evidence we would be making unfounded assumptions about the potential position of [ɔ] in the vowel space of speakers on Bequia.

While all of the areas statistically seem to differ the end points of their diphthongs – none of these are audible to the interviewer. Our study was not aimed at testing the perceptions of speakers to different diphthongs though so it is perhaps worth examining in future.

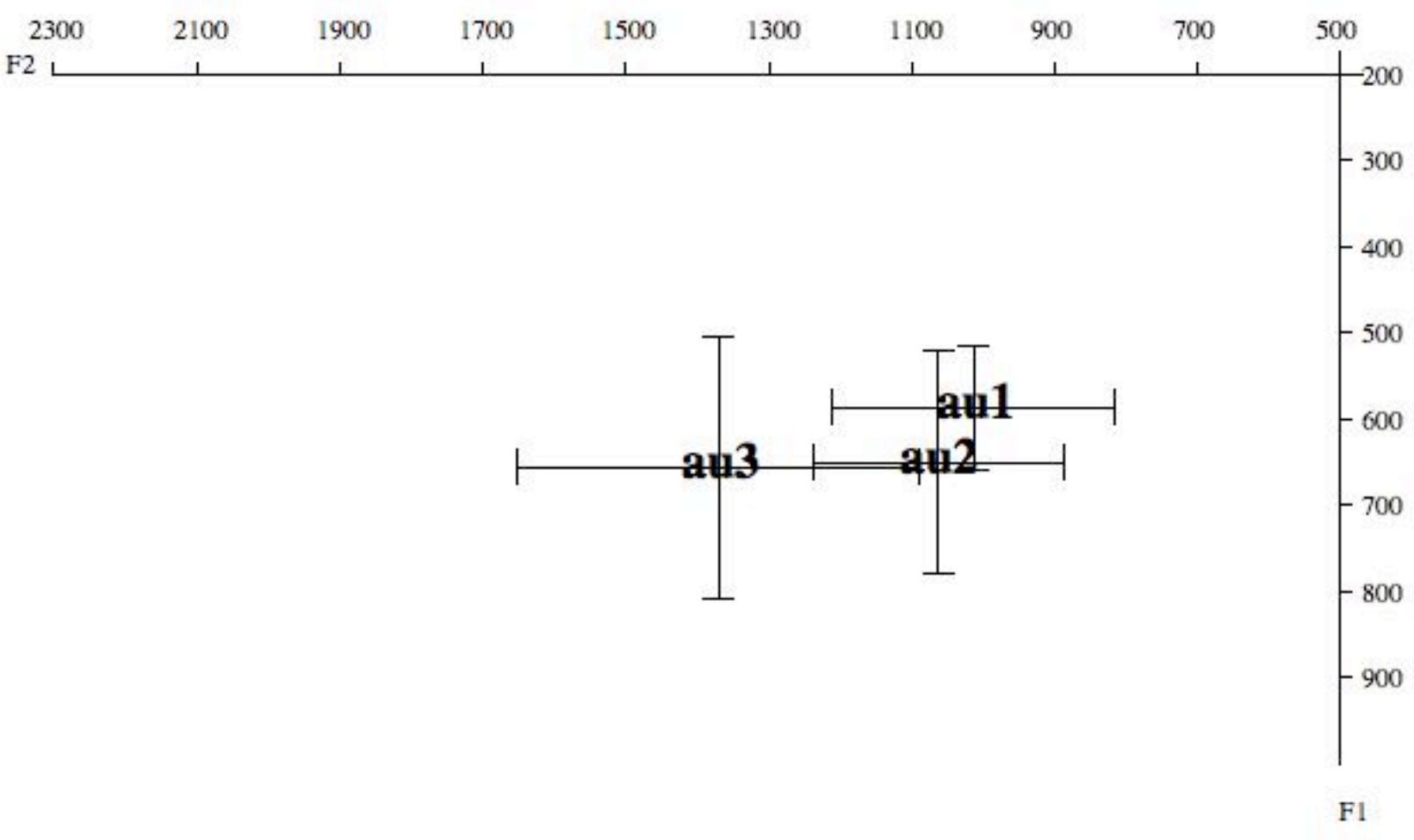


Figure 4.21 - ***potential diphthong and evidence of another monothong in BeqC.***

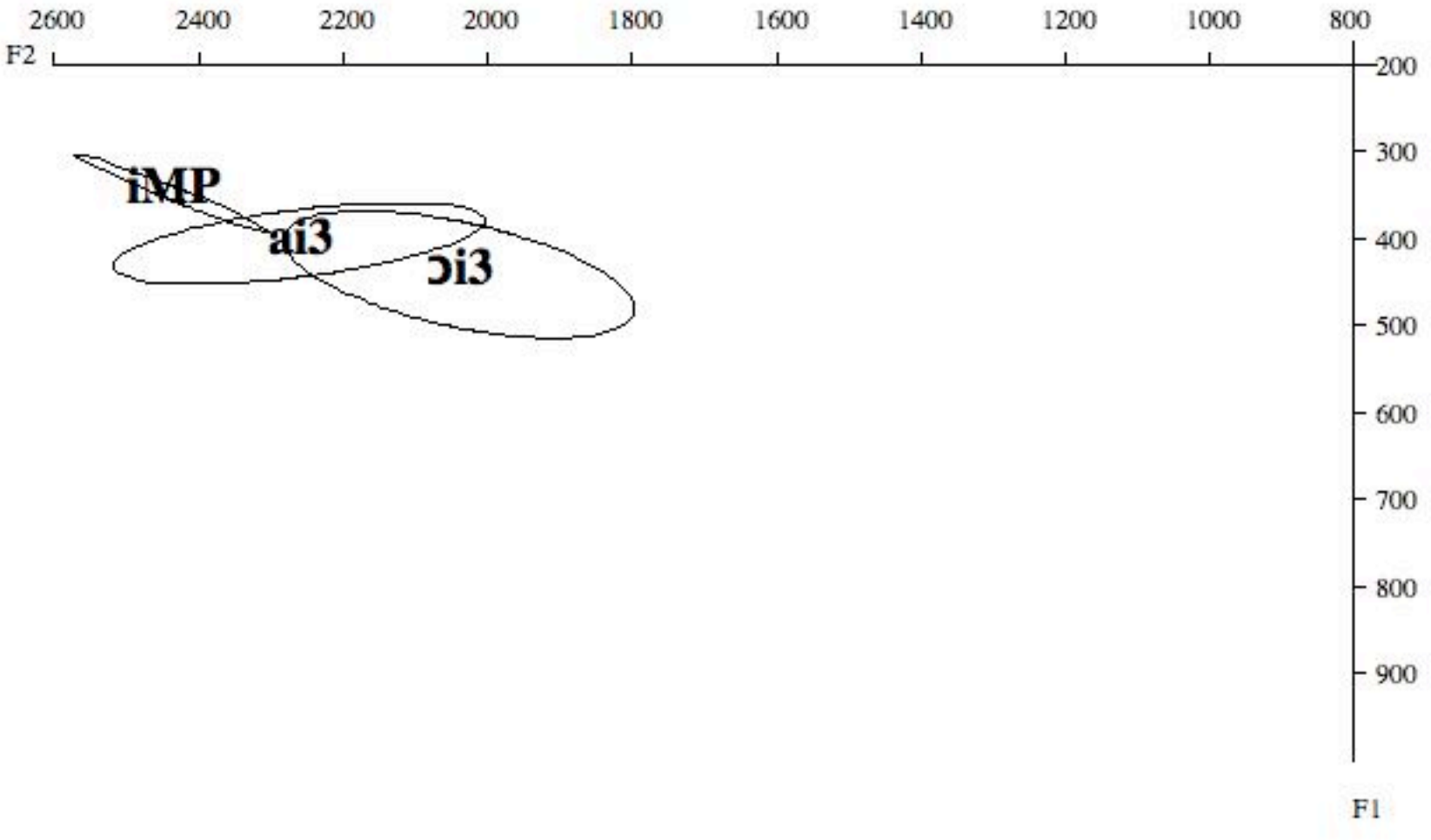


Figure 4.22 - ***End points of the two [i] diphthongs compared to the position of monothongal [i] in Mount Pleasant***

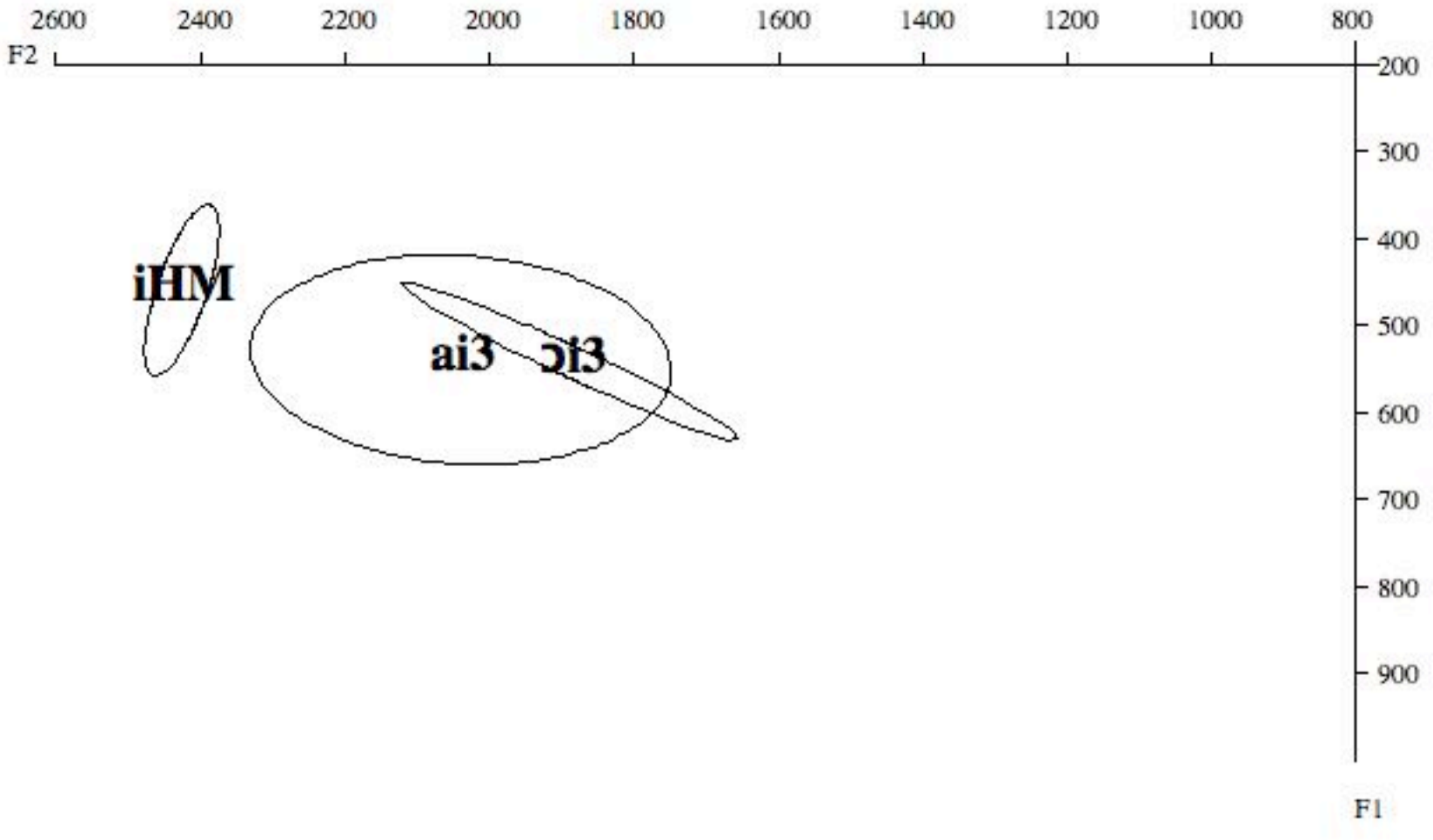


Figure 4.23 - ***End points of the two [i] diphthongs compared to the position of monothongal [i] in Hamilton***

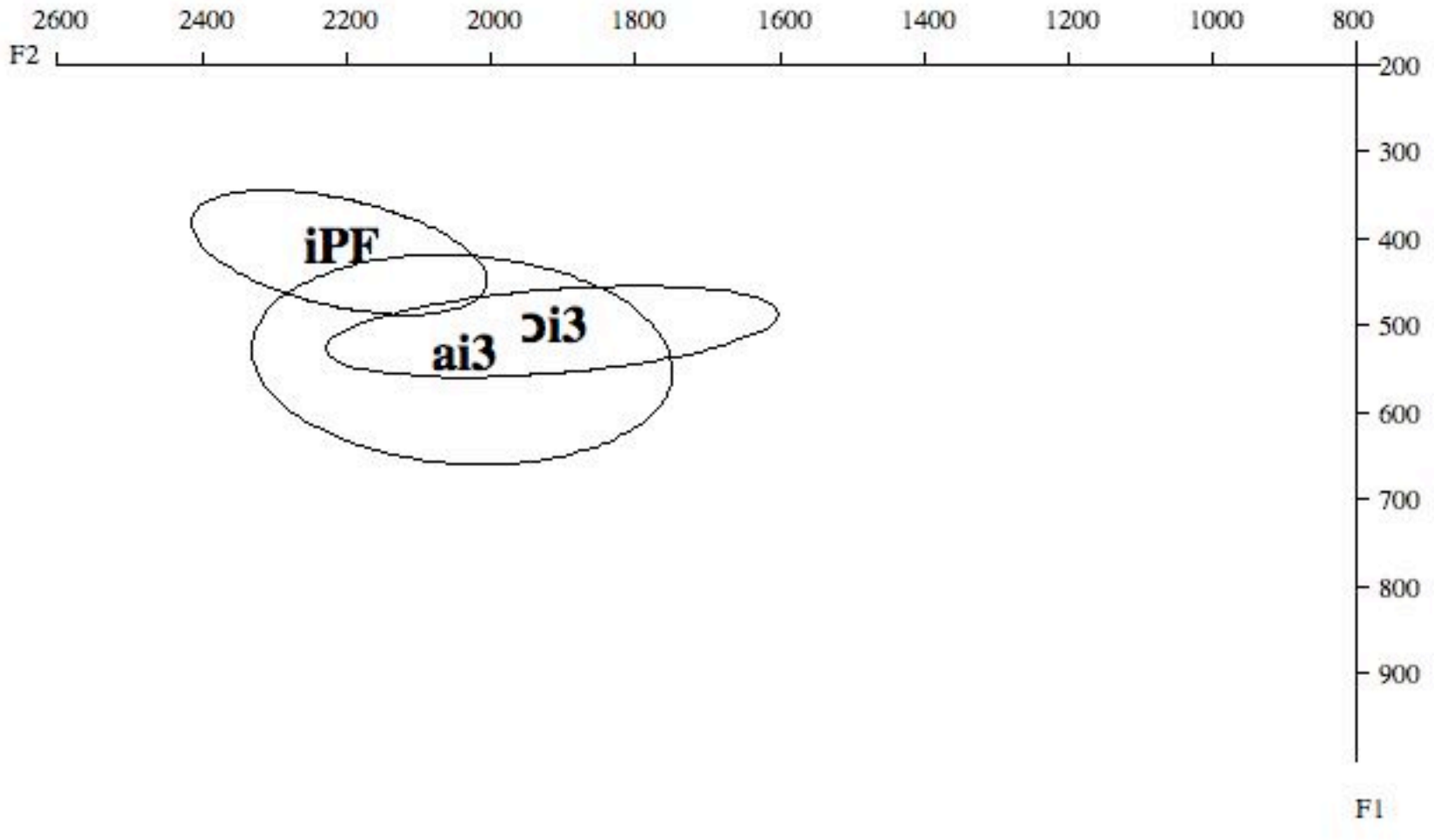


Figure 4.24 - ***End points of the two [i] diphthongs compared to the position of monothongal [i] in Paget Farm***

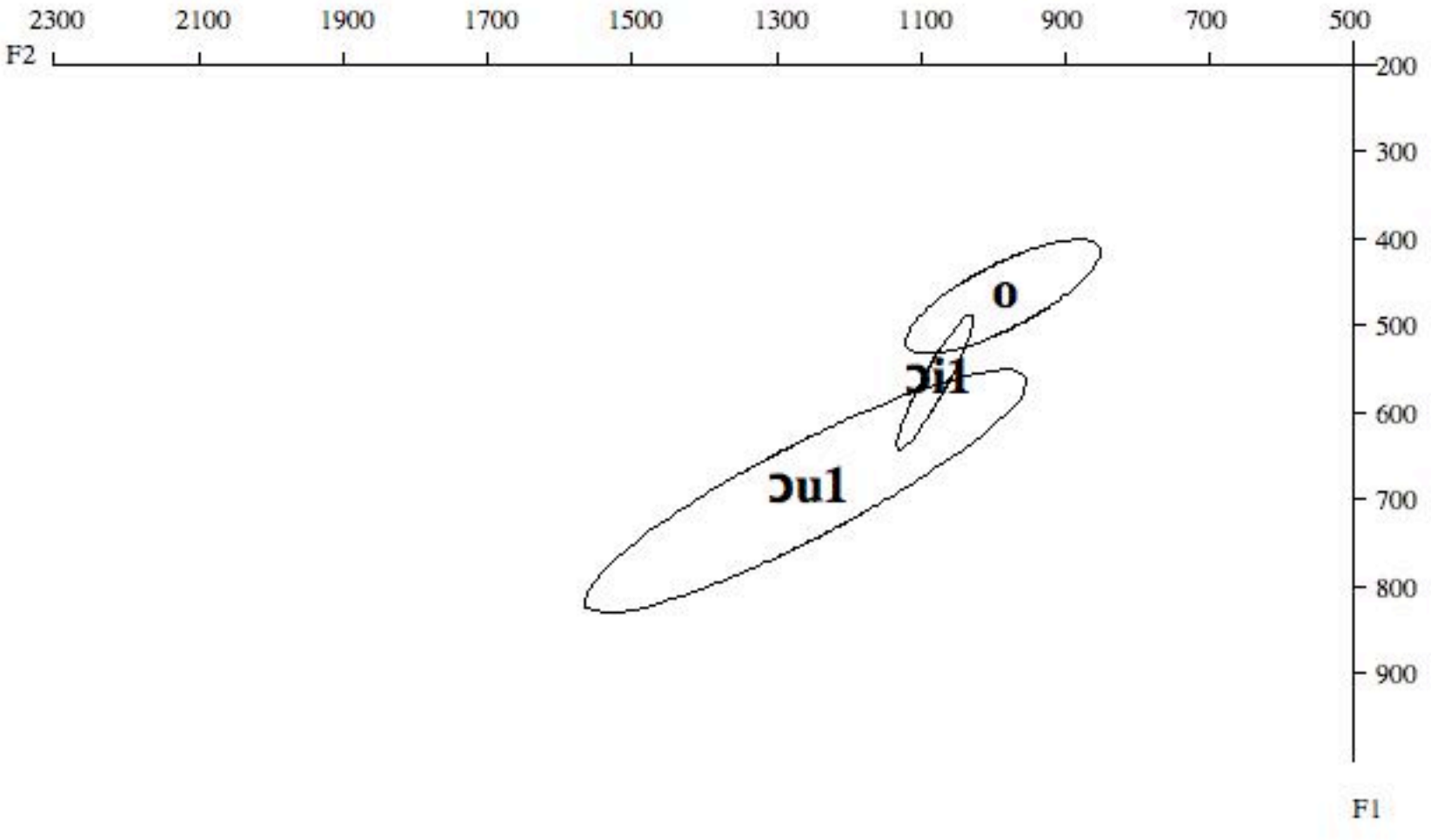


Figure 4.25 - ***Beginning points of the two [ɔ] diphthongs compared to the position of monothongal [o] in Mount Pleasant***

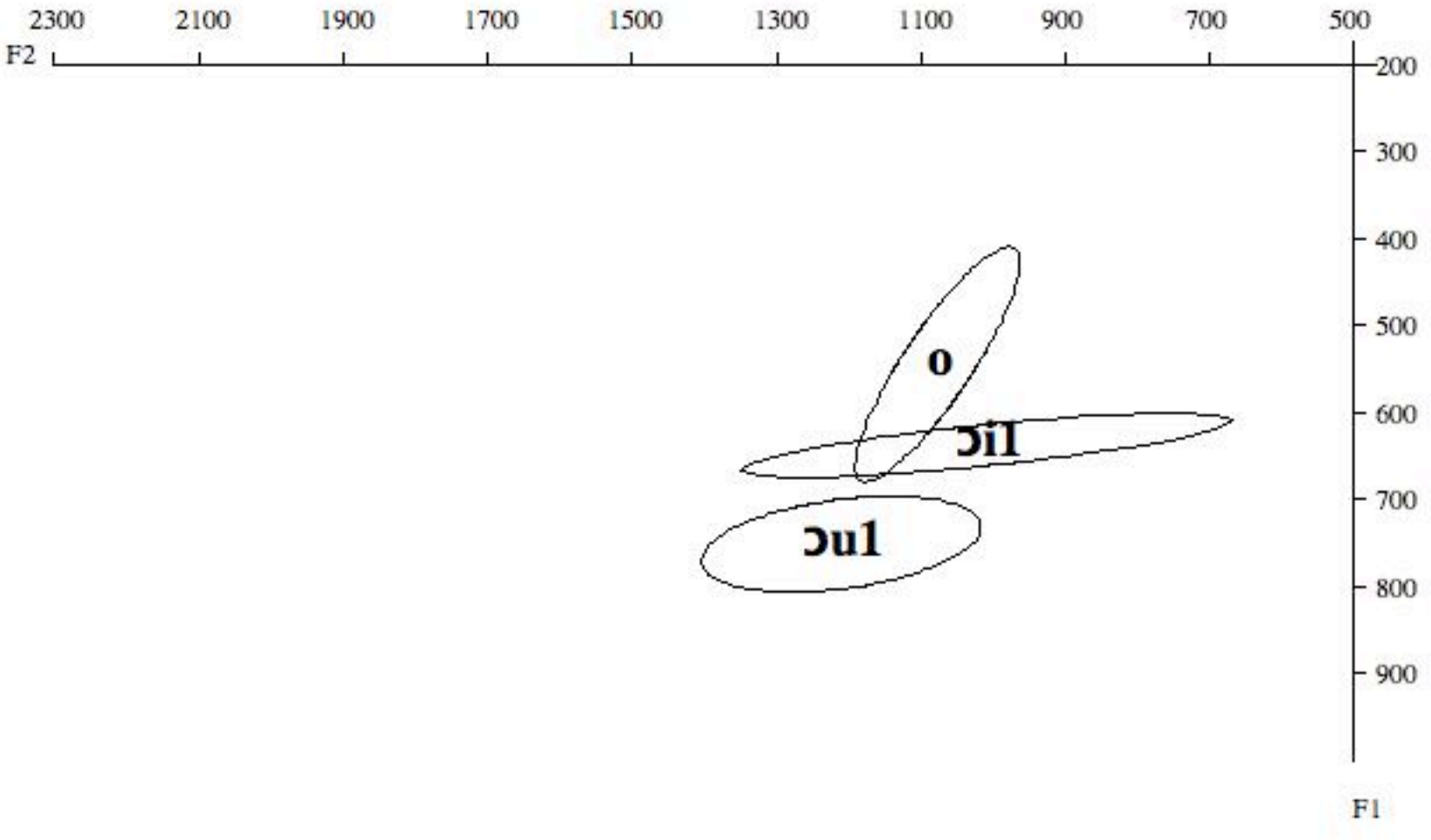


Figure 4.26 - ***Beginning points of the two [ɔ] diphthongs compared to the position of monothongal [o] in Hamilton***

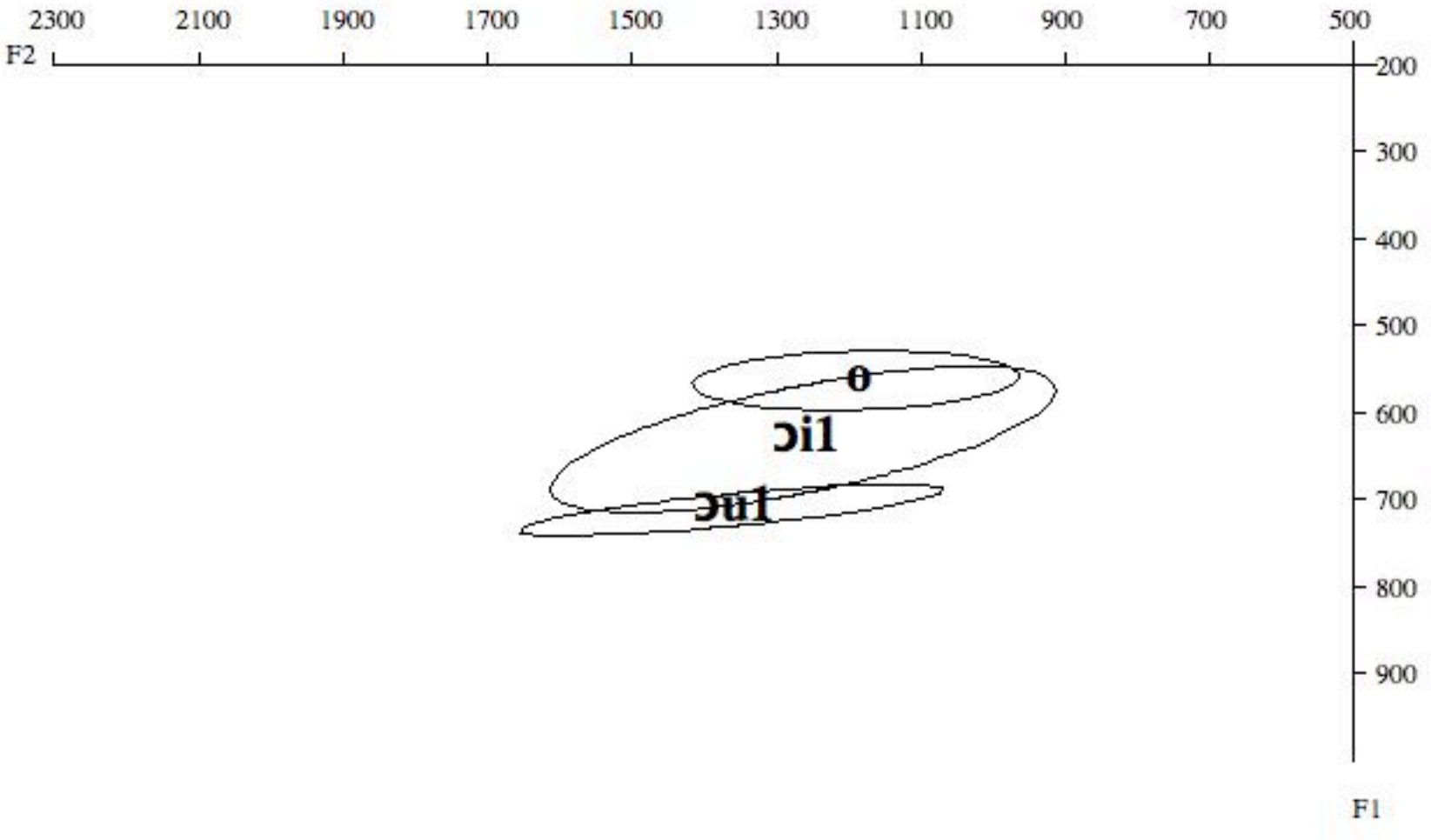


Figure 4.27 - ***Beginning points of the two [ɔ] diphthongs compared to the position of monothongal [o] in Paget Farm***

4.4 Consonants of Bequia

During the hypothesis phase we proposed an almost-finalized inventory of phonemes used by speakers of BeqC for consonants. After going out to Bequia to collect data we almost entirely finalized the consonant chart for BeqC summarized in *table 4.3* below. We will present spectrograms and waveforms as evidence of this table in section **4.4.2**, dividing our findings by the three key criteria for identifying consonants as discussed during the methodology section – namely: manner of articulation, place of articulation and whether there is voicing or not.

To be concise, we will give one example per phoneme where the phonemes are acting in a similar manner to how they do in other dialects of English. In cases where speakers of BeqC are realizing a phoneme differently to other dialects of English or in a manner that merits further discussion, we will draw attention to them briefly during **4.4.2** and pursue them in more detail in section **4.4.3**.

4.4.1 Summary of the consonants of BeqC

Manner of Articulation	**Place of Articulation**								
	Bilabial	*Labia-adental*	*Dental*	*Alveolar*	*Post-alveolar*	*Palatal*	*Velar*	*Labial-velar*	*Glottal*
Plosive	p b			t d			k g		
Nasal	m			n			ŋ		
Trill									
Tap									
Fricative		f v	? ?	s z	ʃ ʒ				h
Affricate					tʃ dʒ				
Approximant				ɹ	j				
Lateral Approximant				l					

Table 4.3 - *Vowel chart of Bequia based on gathered data*

As *Table 4.3* shows – most of the uncertain elements from the hypothesis data were cleared up while in Bequia. Only one set remains uncertain, which is the status of interdental fricatives in BeqC, which we will discuss in section **4.4.3.**

Before explaining the question marks left on the chart or phenomena observed in BeqC we shall provide evidence of the other phonemes existing in the phonemic inventory of speakers across Bequia. To do this we split them up firstly by the manner, then place of articulation, and finally by voicing. In some cases the waveforms in evidence provided have a second waveform track that appears to have considerable noise in it. Unless explicitly stated, this was to make the waveforms readable in ELAN when transcribing, as ELAN favors dual channels. Most speakers with a seemingly noisy track were using the headset microphone, which is mono-audio input only. This extra track does not influence the spectrograms or quality of the words at all so should just be ignored.

As stated during the final section in the methodology section too – unless otherwise stated all evidence presented below comes from the data gathered in Bequia using picture card data. Therefore words presented are taken in isolation.

Where possible during segmenting and labeling we have tried to follow the rules laid out by Turk, Nakai and Sugahara (2006).

4.4.2 Evidence of the consonants used in BeqC

Plosives:

Plosives, otherwise known as stops, are generally classified as that due to at some point during their realization the air going through the vocal tract is stopped, as stated in Ladefoged (2005) "Vowels and Consonants". As a result we will use the waveform to examine the voicing status of each group of plosives, while to differentiate each of the consonants in terms of place of articulation we will use the second and third formant movements as stated in Ladefoged (2005: 51) who points out the second and third formants are what differentiates one stop from another whilst the first formant marks the phonemes as having a stop closure.

Starting with bilabial plosives, **figures 4.28** ("*pie*") and **4.29** ("*boy*") demonstrate examples of both the voiceless [p] and voiced [b] respectively. Usually you would expect to see no formants initially for the bilabials due to the mouth closing completely initially – while this is difficult to see in the data due to not being in an acoustics laboratory – what does show about [p] in BeqC is that in this context it is aspirated word initially. This has a tendency to happen in BeqC and we will discuss it

in detail at the end of this section. As with other stops, what distinguishes the [p] and [b] from one another is the no voicing/voicing distinction between speakers. As shown in **figure 4.28** there are no vocal fold vibrations in the waveform for [p], which distinguishes this phoneme as a voiceless bilabial, while **figure 4.29** demonstrates vocal fold vibration in the waveform for all the way up to the release of [b], indicating the consonant is voiced.

Figures 4.30 ("*toys*") and **4.31** ("*door*") demonstrate alveolar plostives [t] and [d], although unfortunately the word-final minimal pairs proved not to be possible as the planned pairs of [t] and [d] in the data collected were not fully released word-finally. You can see the second and third formants in the spectrogram for [d] are roughly level until after the release as one would expect from [d] and likewise for [t] as they tend to share the same formant movements. This is due to the similar lip and tongue movements used to articulate both phonemes.. What distinguishes [t] and [d] from one another is the voicing status of the two consonants. As you can see in the case of [t] there is no voicing in the waveform as the speaker releases the stop there is a weaker burst of energy across higher frequencies (**Figure 4.30'**s spectrogram is displaying up to 10,000Hz). For the [d] at the start of "door" you can see in the waveform that there is vocal fold vibration before a much more concentrated release than seen for the [t], this vibration not only shows the voiced/voiceless distinction between the two alveolar phonemes but it also shows that both phonemes exist in BeqC.

Finally the velar plosives [k] and [g] are demonstrated in **figures 4.32** ("*cake*") and **4.33** ("*gun*"). Firstly both are shown to be velar by the movement of the second and third formants in the spectrogram are quite close together, however not as close together as perhaps would be expected for a velar, given the back of the tongue should be making contact with the roof of the mouth. Once again these two sounds are differentiated by voicing status as well, as shown by the lack of voicing during the build up to release of the [k] word initially for "cake", whilst there is clear vocal fold vibration before the release of the [g] for "gun", showing a distinction between the two consonants.

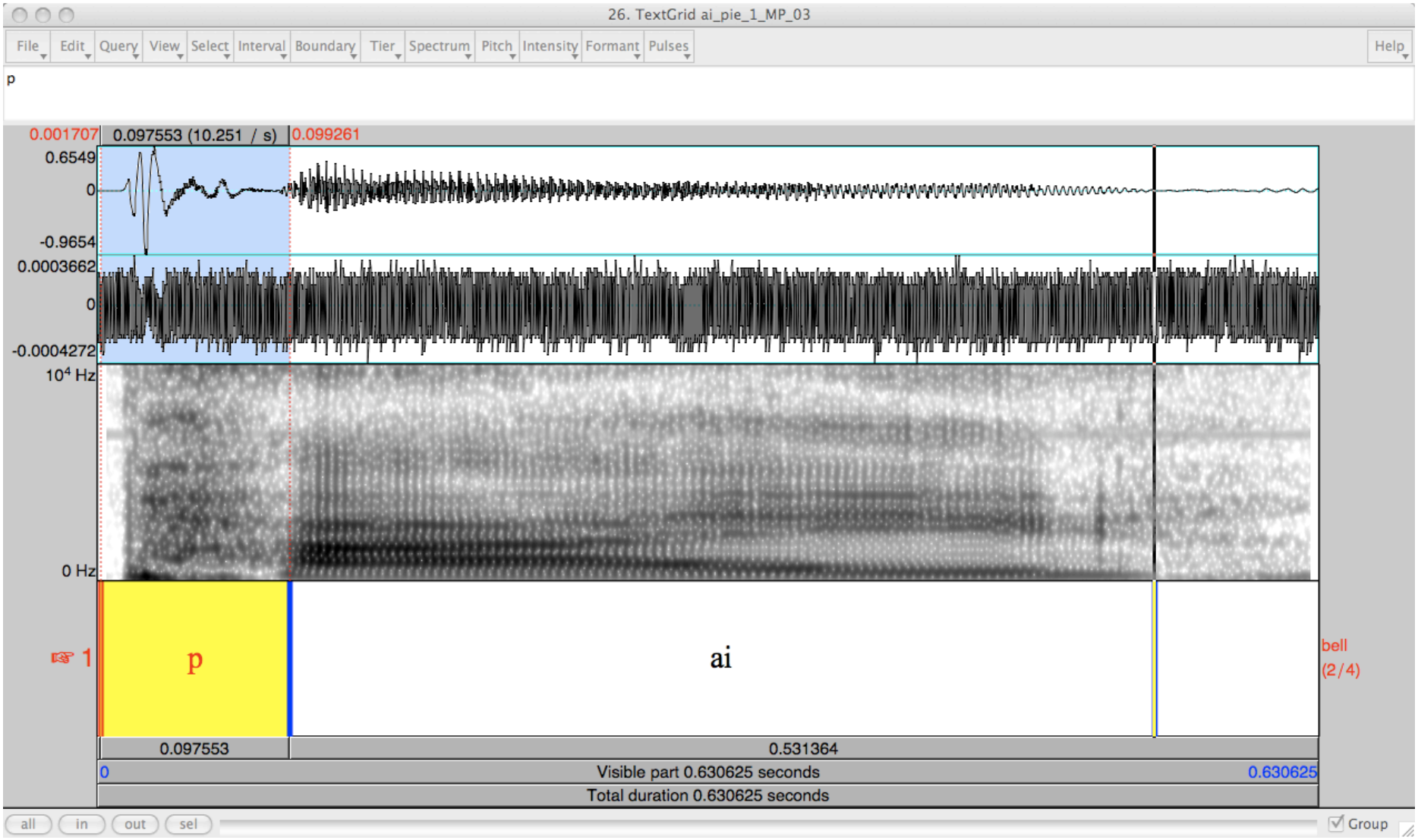


Figure 4.28 ***An example of a voiceless bilabial plosive [p] in BeqC***

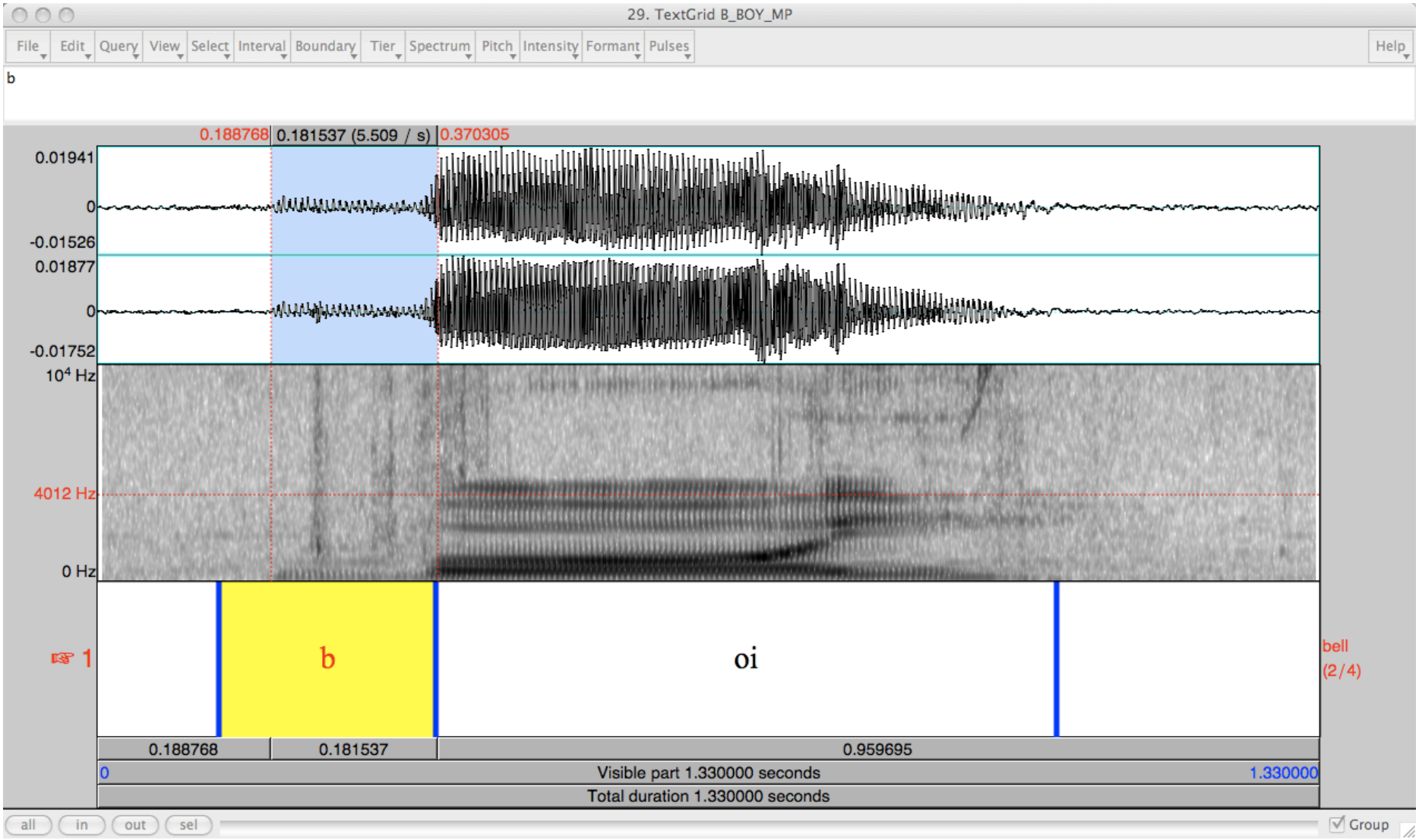


Figure 4.29 - *An example of a voiced bilabial plosive [b] in BeqC*

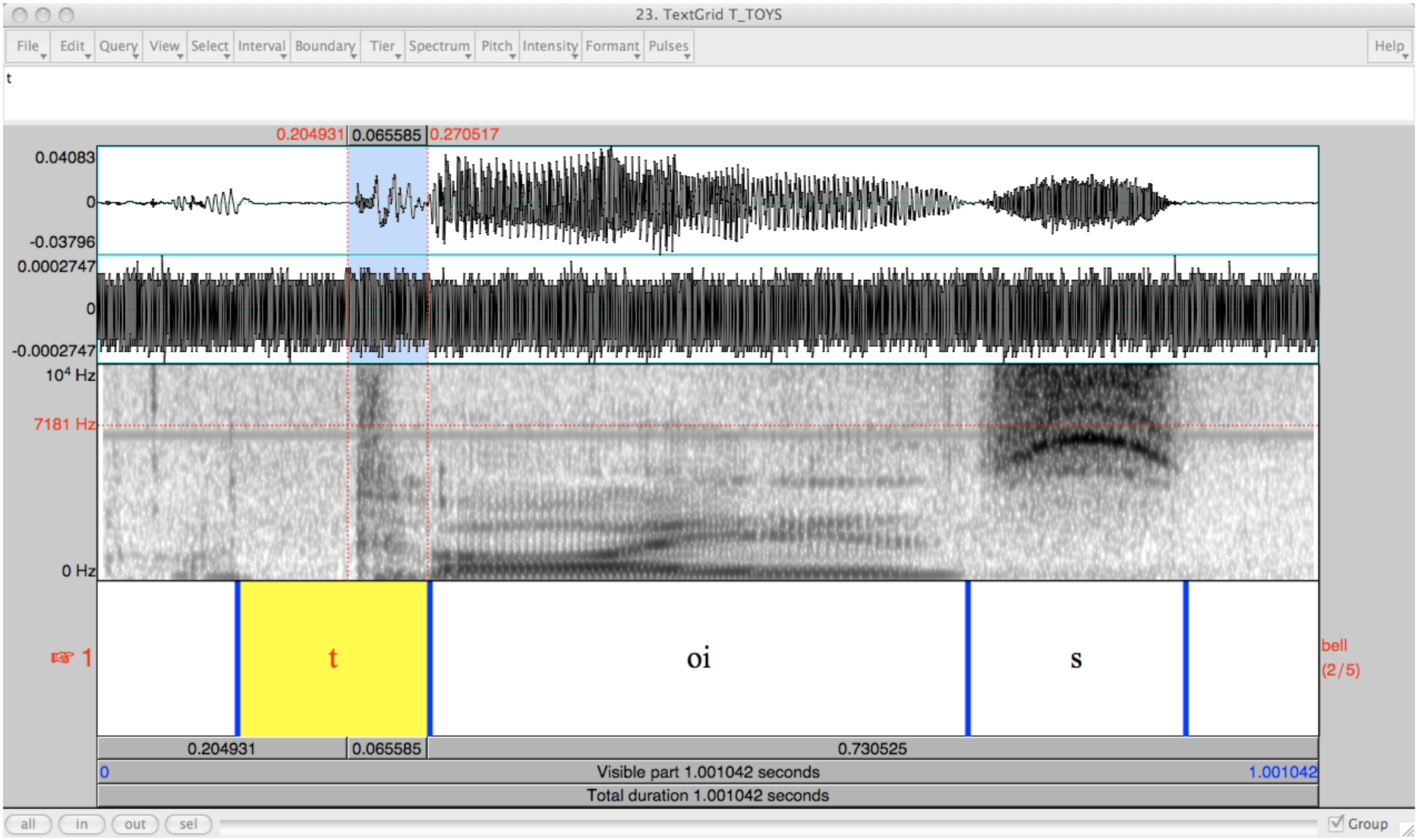


Figure 4.30 - ***An example of a voiceless alveolar plosive [t] in BeqC***

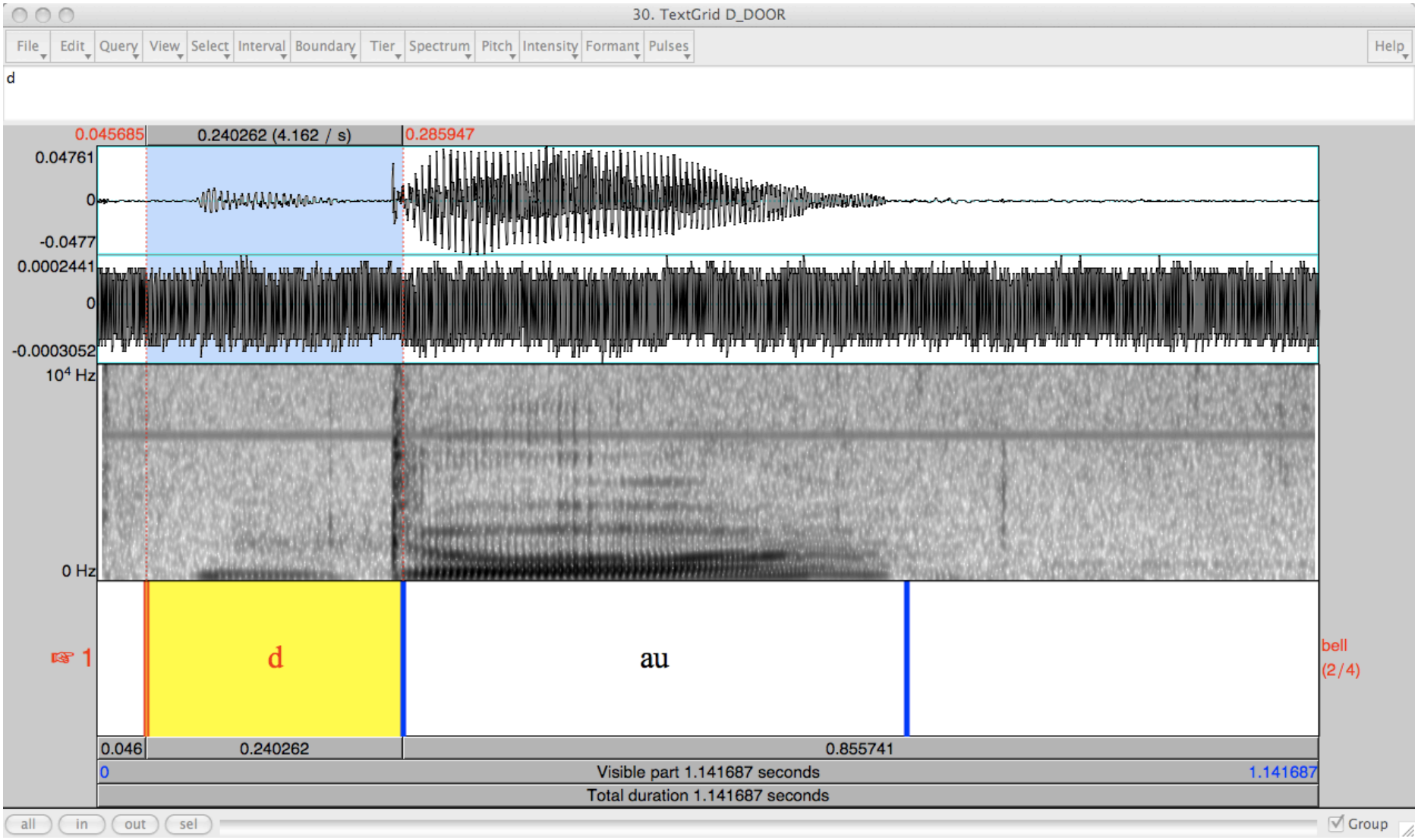


Figure 4.31 - *An example of a voiced alveolar plosive [d] in BeqC*

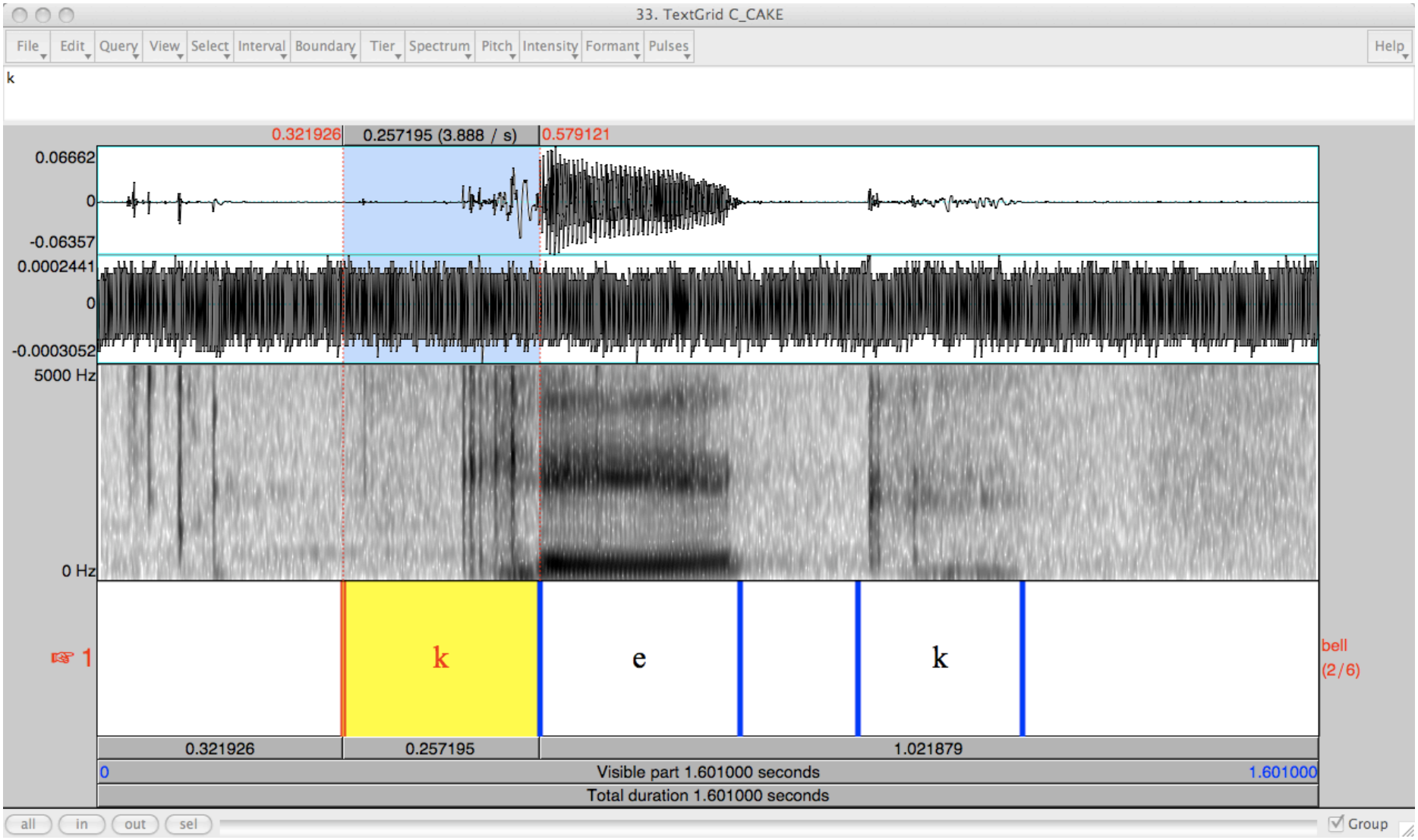


Figure 4.32 - *An example of a voiceless velar plosive [k] in BeqC*

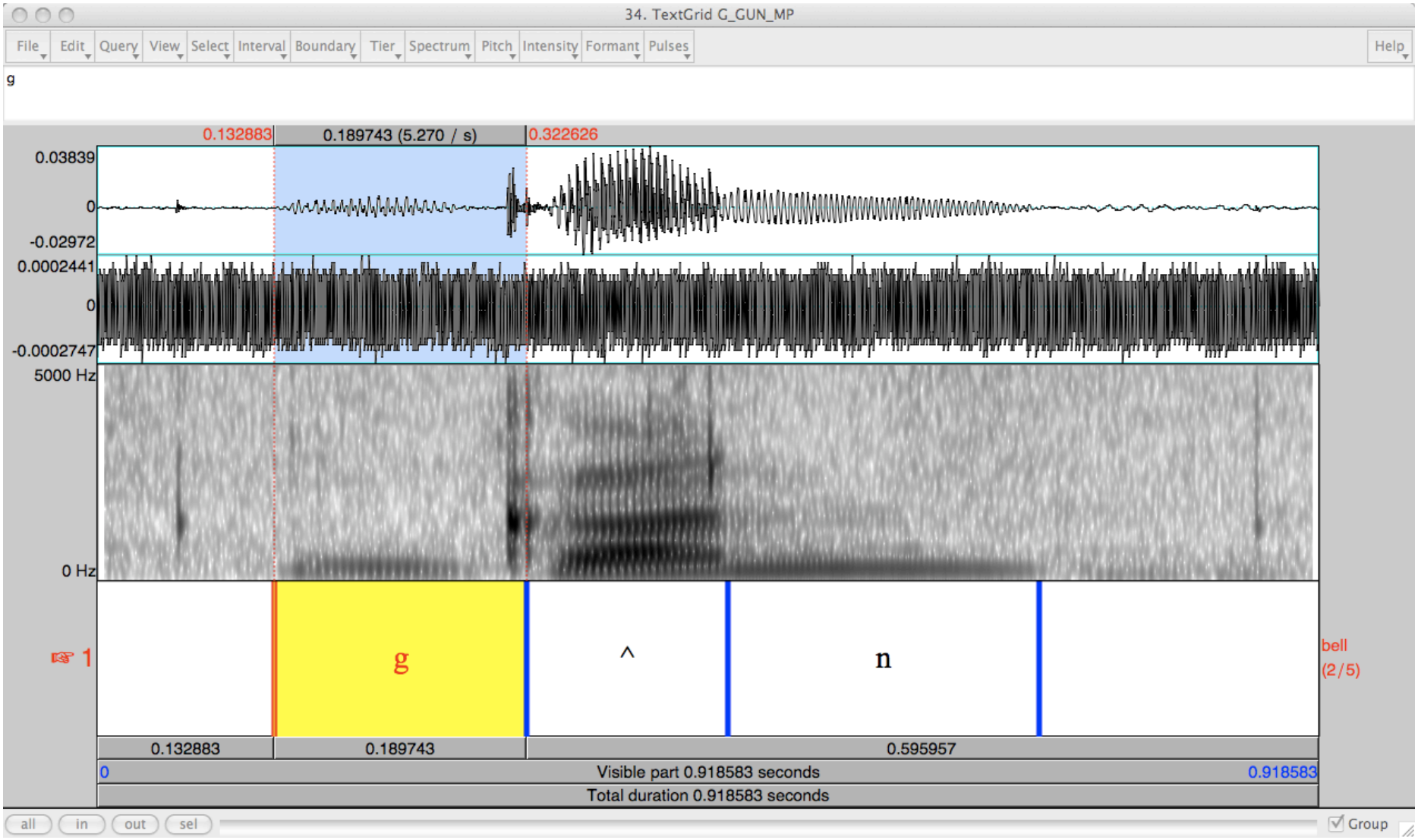


Figure 4.33 - *An example of a voiced velar plosive [g] in BeqC*

Nasals:

As discussed in Ladefoged (2005: 55) nasals are in many ways similar to vowels. Like vowels, voiced/voiceless distinctions are not usually relevant to differentiating between nasals so we tend to use their formants to judge. The key difference between identifying vowels and nasals is that a nasal's formants are generally weaker than a vowel's. Looking across the evidence provided for nasals, the unifying factors that shows each of the respective phonemes to be nasal is the weaker F1 visible in the spectrograms around 200-300Hz, with another formant visible higher up between 2500-2600Hz in BeqC speaker. Another, perhaps more important, key factor for nasals, as demonstrated in the spectrogram for the bilabial nasal in **figure 4.34** ("*lime*"), is the slight gap at the start of the nasal in F3 where the tongue has made contact at the roof of the mouth followed by a decrease in amplitude for the waveform. In most examples you can see most if not all of these key features of nasals however, in some examples given this is hard to see. Some features can be hard to see due to the recordings not taking place in an acoustic laboratory but there appears to be no evidence suggesting BeqC speakers realize nasals in a different fashion to other varieties of English. The main differences distinguishing nasals from one another that we will go on to describe below come from the onset of the nasal segments as opposed to during the main nasal component.

Starting with the evidence for a bilabial nasal [m], **figure 4.34** ("*lime*"), which demonstrates a word final [m] in BeqC. Looking at the onset of [m] you can see the first and second formants behaving in a very similar fashion to the bilabial plosive [b], with the second formant curving downwards just before the labeled start of [m].

Continuing the examination of nasals, evidence of an alveolar nasal [n] can be found in **figure 4.33** ("gun"). The formant movements during the onset of [n] are very similar to those of [m] as you can see the second formant also moves downwards here. What distinguishes [n] from [m] can be seen if you compare the third formant between "lime" and "gun"**,** the third formant during the onset of [n] is slightly higher than it is for the onset of [m] as highlighted in both figures.

Finally the velar nasal [ŋ] is more easily identified than [m] or [n] between one another. Examining **figure 4.35** ("*ring*"), you can see during the onset of the

consonant that the second formant meets the third formant, which is how the velar nasal is usually identified compared to other nasals.

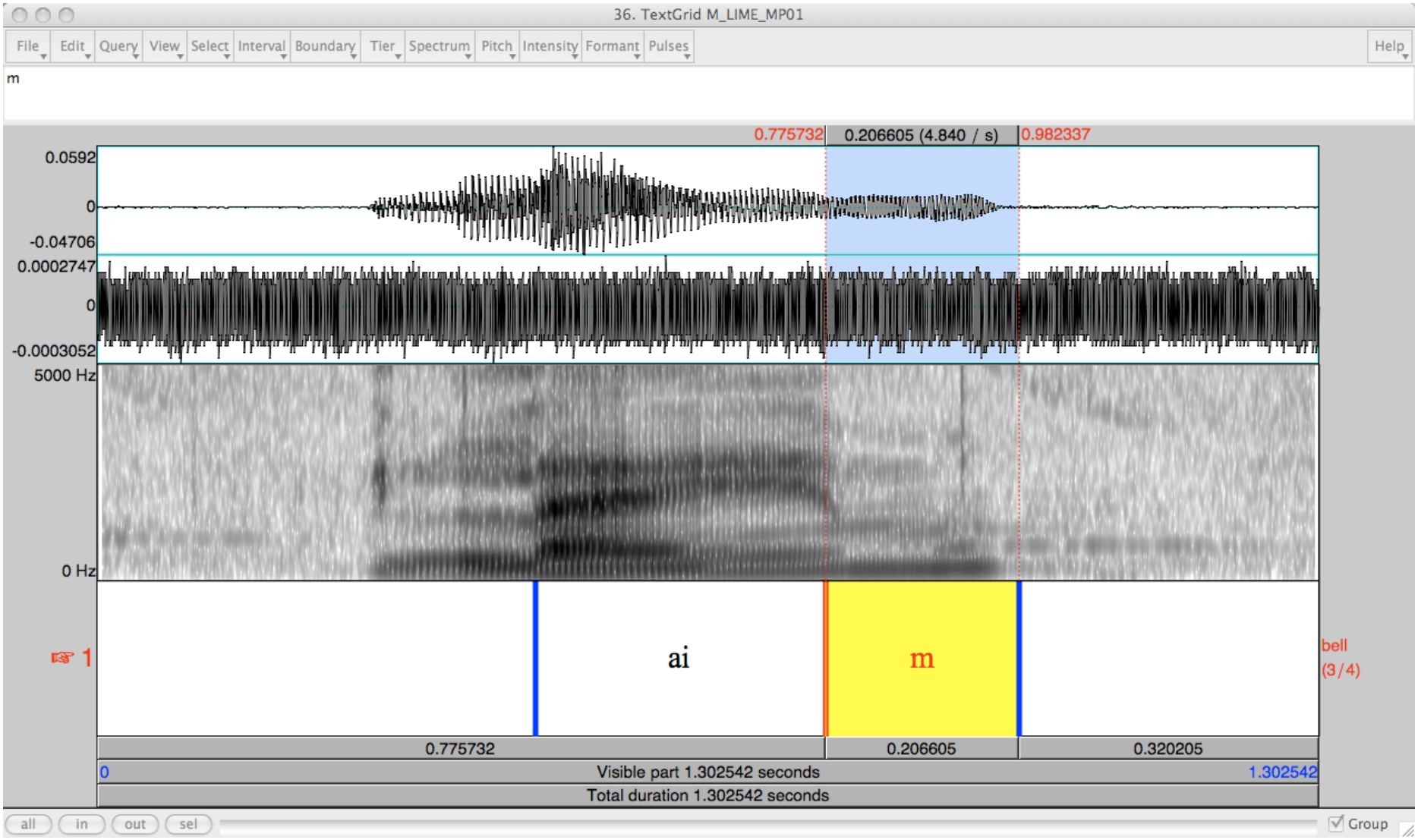


Figure 4.34 - *An example of a bilabial nasal [m] in BeqC*

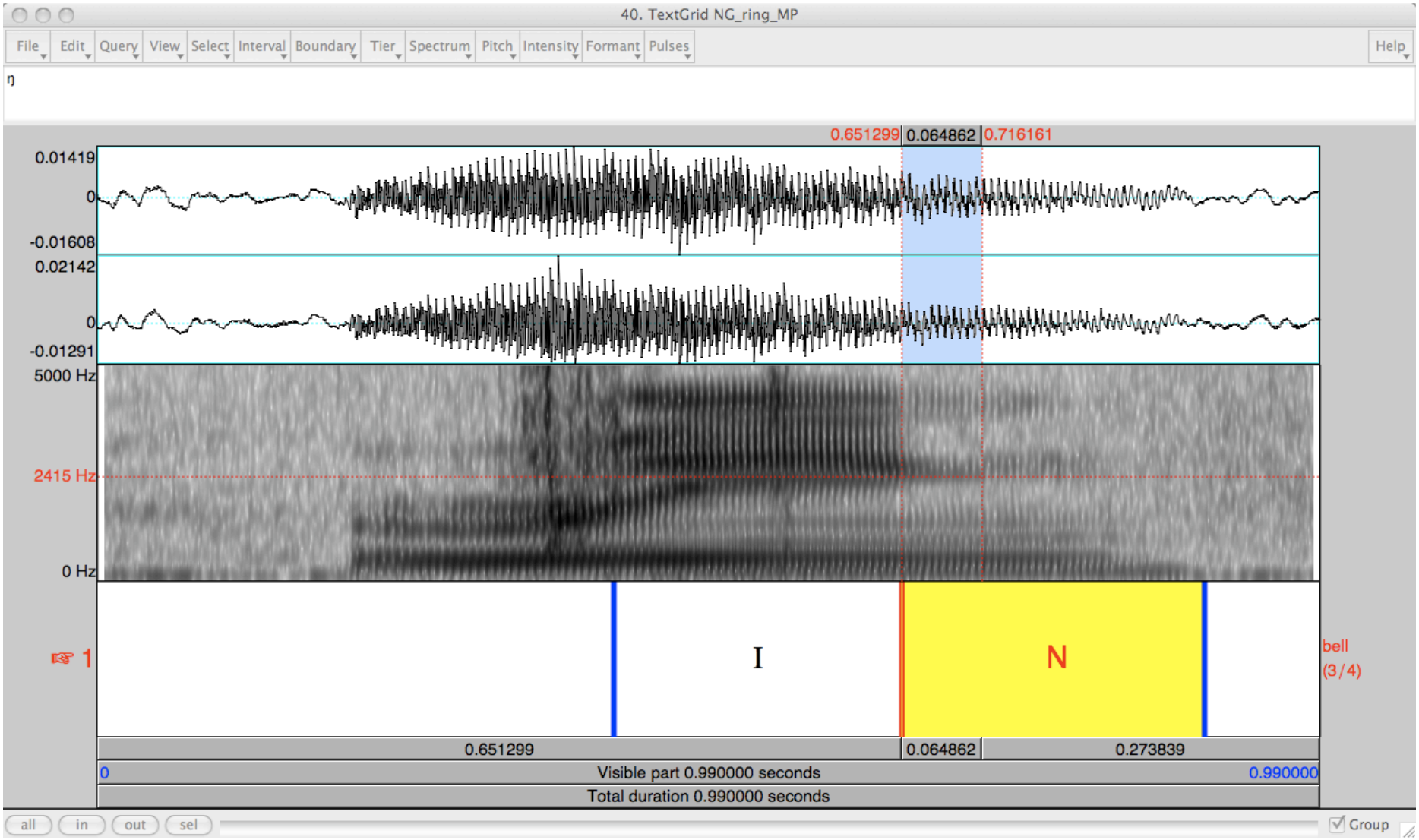


Figure 4.35 - *An example of a velar nasal [g] in BeqC*

Fricatives

Fricatives are characterised as having higher frequency of random noise with short durations due to air being forced through a narrow space. Voiced fricatives are generally identifiable due to vocal fold pulses during realization of a fricative. The evidence below shows the different fricatives by highlighting the different places and manners of articulation.

Starting with the labiodental fricatives [f] and [v], as shown in **figure 4.36** ("f*ace*") and **4.37** ("*vase*"), there are several ways of distinguishing them from other fricatives. Firstly there should usually be a higher concentration of random energy around 3000-4000Hz for an [f], and not so much at upper frequencies, in this case it does not seem to be the case when viewing the spectrum up to 10,000Hz. Secondly, the following segment's fourth formant should start at under 4000Hz according to Ladefoged (2005: 57) – which is visible in this case as the fourth formant comes in at approximately 3900Hz. The voiced fricative distinguishes itself from the voiceless [f] by the striations shown in the spectrogram for "v*ase*"**,** which show vocal fold pulses during articulation. **Figure 4.37** also shows a case of [e] rising in BeqC near the end of the vowel, we will discuss this in further detail during the discussion section, **5.1.**

When laying out the vowel chart at the start of this section the state of interdental fricatives is uncertain after data collection, for a number of reasons. Certain evidence we will present in **4.4.3** suggests that speakers of BeqC may use interdentals occasionally when hyper-correcting words when talking to people they do not know well from off the island, however for now we will merely state that its status is unknown in BeqC and ideally should be clarified to propose the phonemic inventory of the island.

Alveolar fricatives [s] and [z] are shown word finally in **figures 4.38** ("*shoes*") and **4.39** ("*maze*"). These fricatives can be identified by the starting of the random energy being at a higher frequency than the labiodental fricatives [f] and [v] – starting around 6000Hz in each. The vertical striations for voicing in [z] are not very visible however the voicing is still audible. This may be related to what appears to be an optional process devoicing of [z] word finally in many speakers based on the available sample. We will discuss the devoicing in more detail in section **4.4.3,** however whether

devoicing is happening or not in BeqC the voiced alveolar fricative is a part of speaker's phonemic inventories.

Postalveolar fricatives [ʃ] and [ʒ] also are a part of the BeqC phonemic inventory as shown in **figure 4.38** ("*shoes*") for the voiceless fricative. As demonstrated with a word like "shoes" – what differentiates it from the alveolar fricative [s] is that its random energy distribution starts at a lower frequency, in the case of the evidence presented, around 3000Hz.

We had planned to collect samples of the voiced postalveolar fricative [ʒ] from speakers during the word card segment of the interviews, but due to that being abandoned we lost the chance to collect direct evidence of the token. The closest comparable sound would have been the affricate [dʒ] which is comprised of an alveolar stop [d] followed by the desired token. We can extrapolate that the [ʒ] is a part of the islands phonetic inventory as well, however the one example of this we should have ("cage") appears to be the affricate [tʃ] instead. Evidence from the corpus in **figure 4.40** ("*occasion*") demonstrates our claim of a voiced alveolar fricative in BeqC, as demonstrated by the vertical striations in the consonant while the same approximate energy distribution to its voiceless counterpart [ʃ]. Acoustic evidence heard on the island coupled with examples as seen in **figure 4.40** ("*occasion*") from the corpus data strongly suggests that there is a voiced alveolar fricative.

Although arguably not entirely a voiceless fricative, as the source of the sound is not air being forced through a small gap but instead turbulence caused by air moving across the surfaces of the vocal tract, the fricative [h] is demonstrated in **figure 4.41** ("*hay*"). You can see a noisy second and third formant, where it is quite difficult to tell where the dividing line between formants is. Typically [h] is characterized by the distribution of a noisy third formant usually beneath 3000Hz. In this case it is hard to tell precisely where the third formant is however the distribution of noise from where the second formant is to where the third formant would be matches this description.

Finally although termed as an affricate, as it is comprised of a stop and a fricative, we will demonstrate [tʃ] being a part of BeqC speakers phonemic inventories in the evidence for fricatives in **figure 4.42** ("*cheese*")**.** There is very little evidence of the

[t] in the affricate, however you can see a very brief and small release initially before the abrupt beginning of the [ʃ] which is approximately 50 milliseconds shorter in duration than the fricative on its own as shown in **figure 4.38** ("*shoes*")**.**

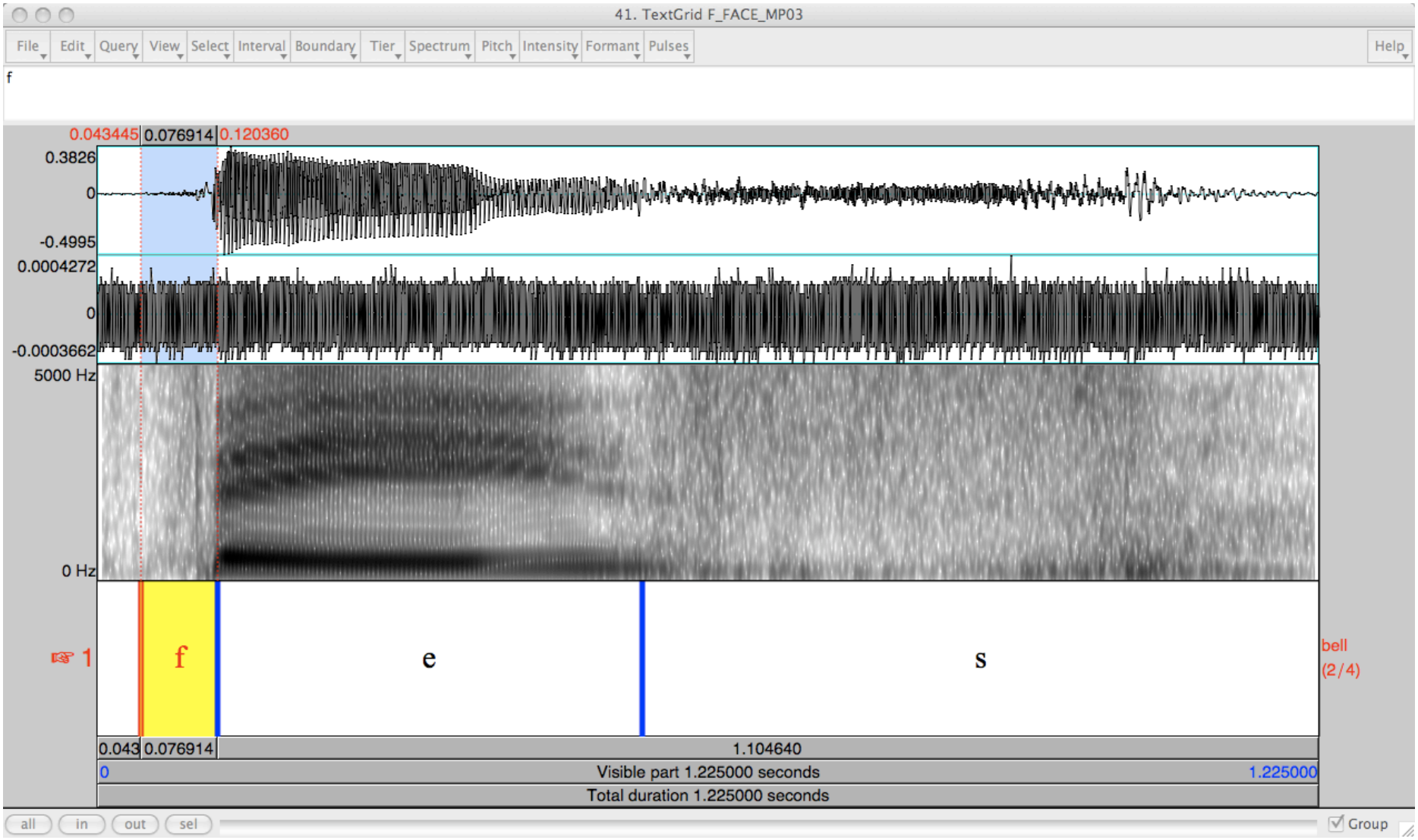


Figure 4.36 - *An example of a voiceless labiodental fricative [f] in BeqC*

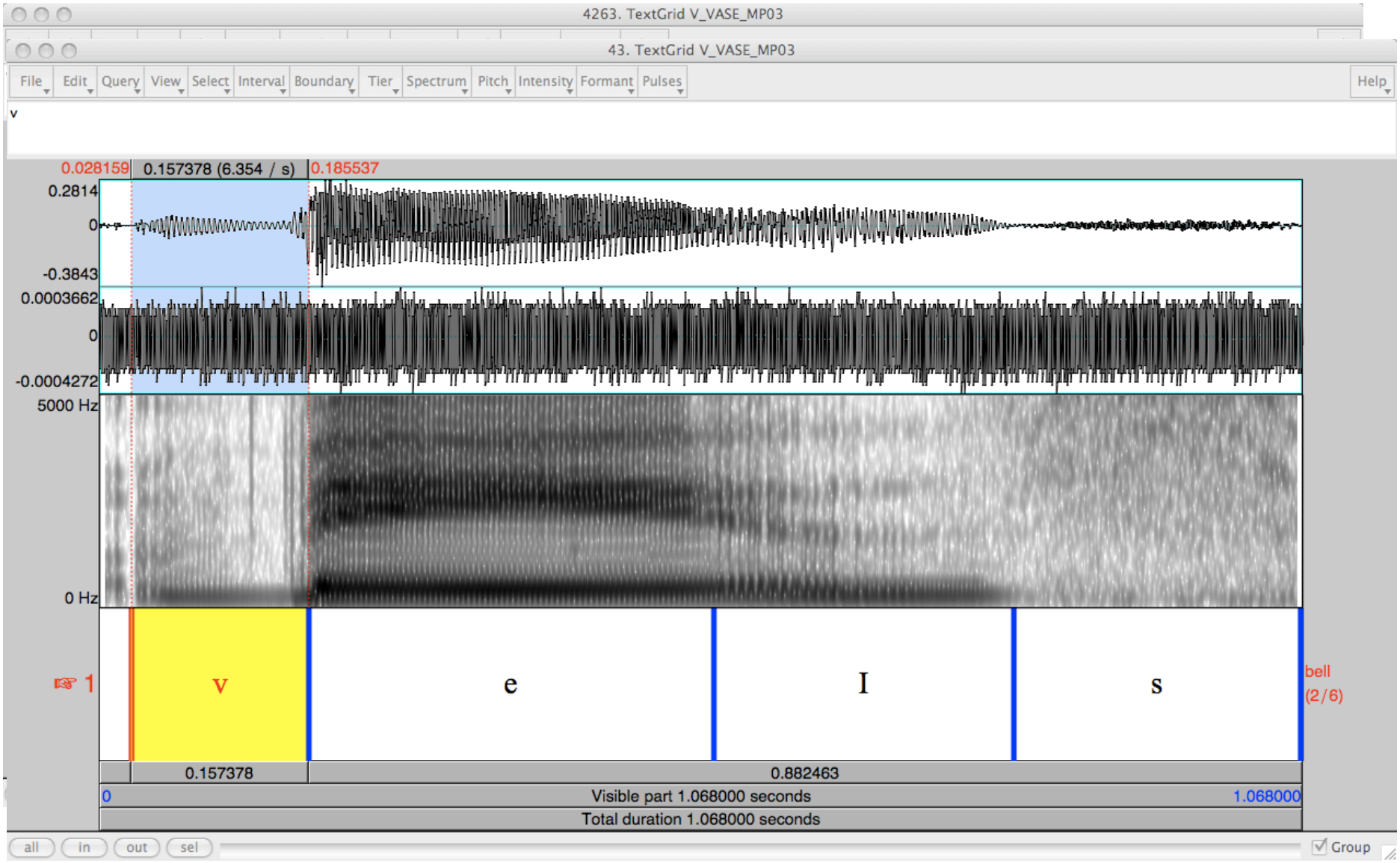


Figure 4.37 - *An example of a voiced labiodental fricative [v] in BeqC*

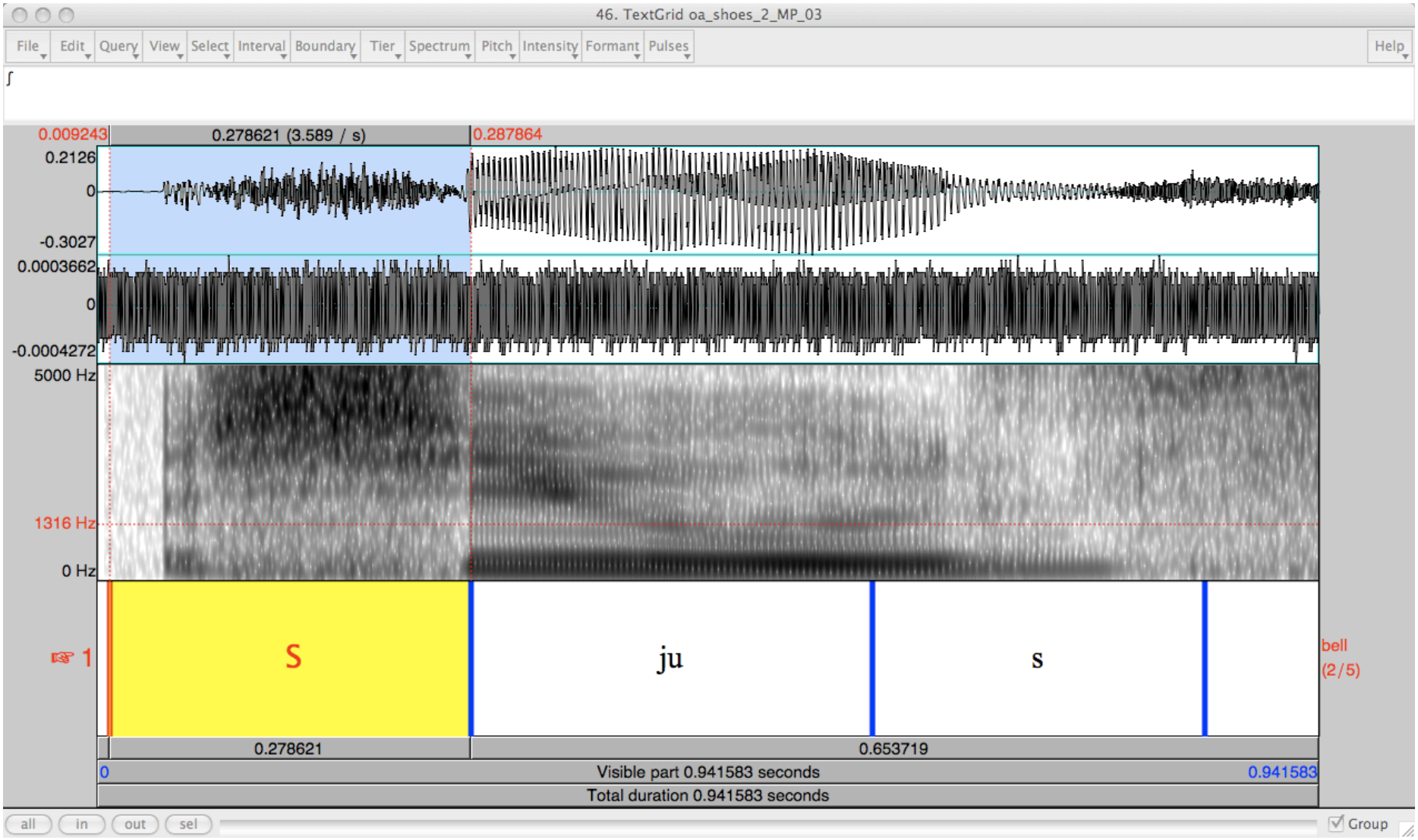


Figure 4.38 - *An example of a voiceless alveolar fricative [s] in BeqC*

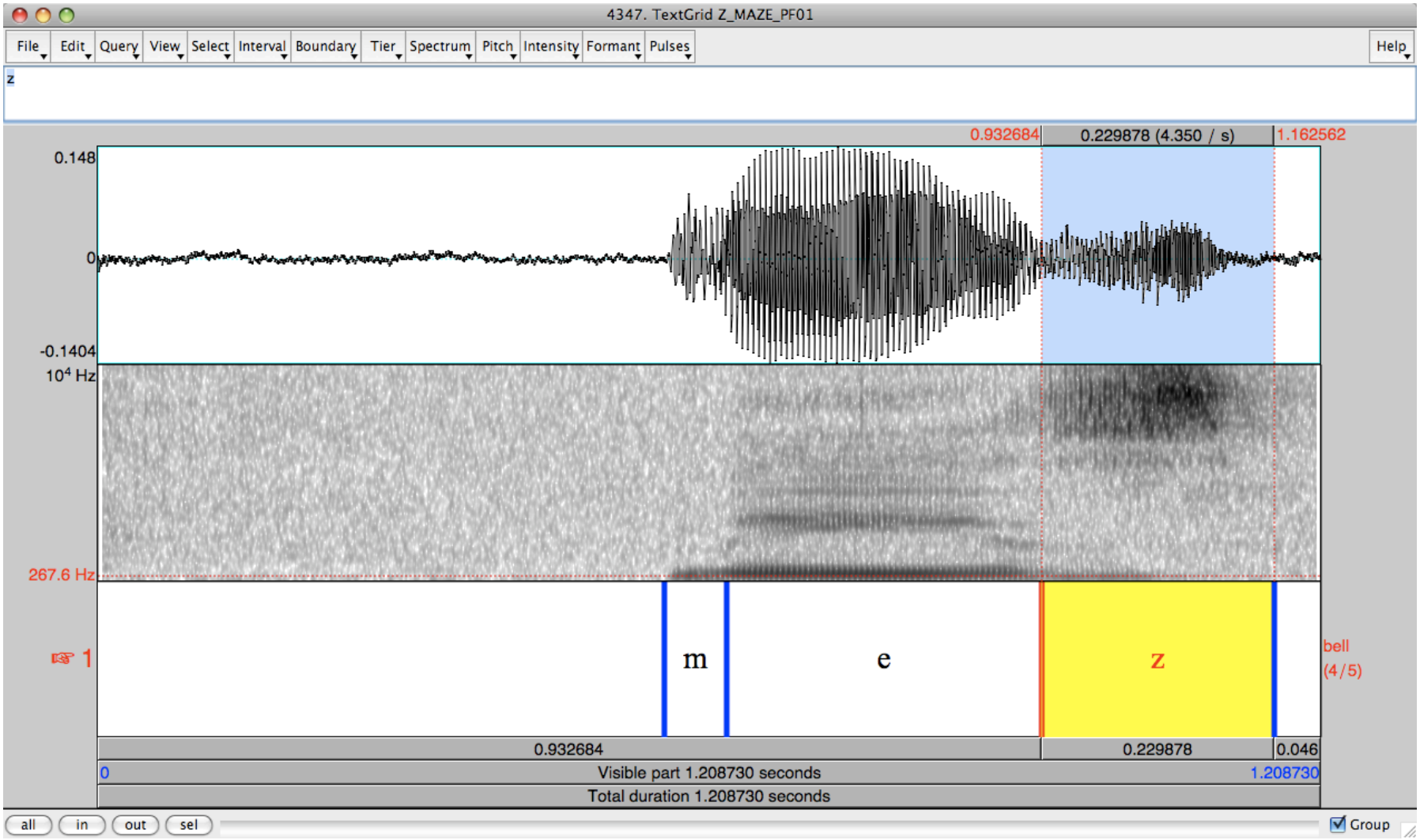


Figure 4.39 - *An example of a voiced alveolar fricative [z] in BeqC*

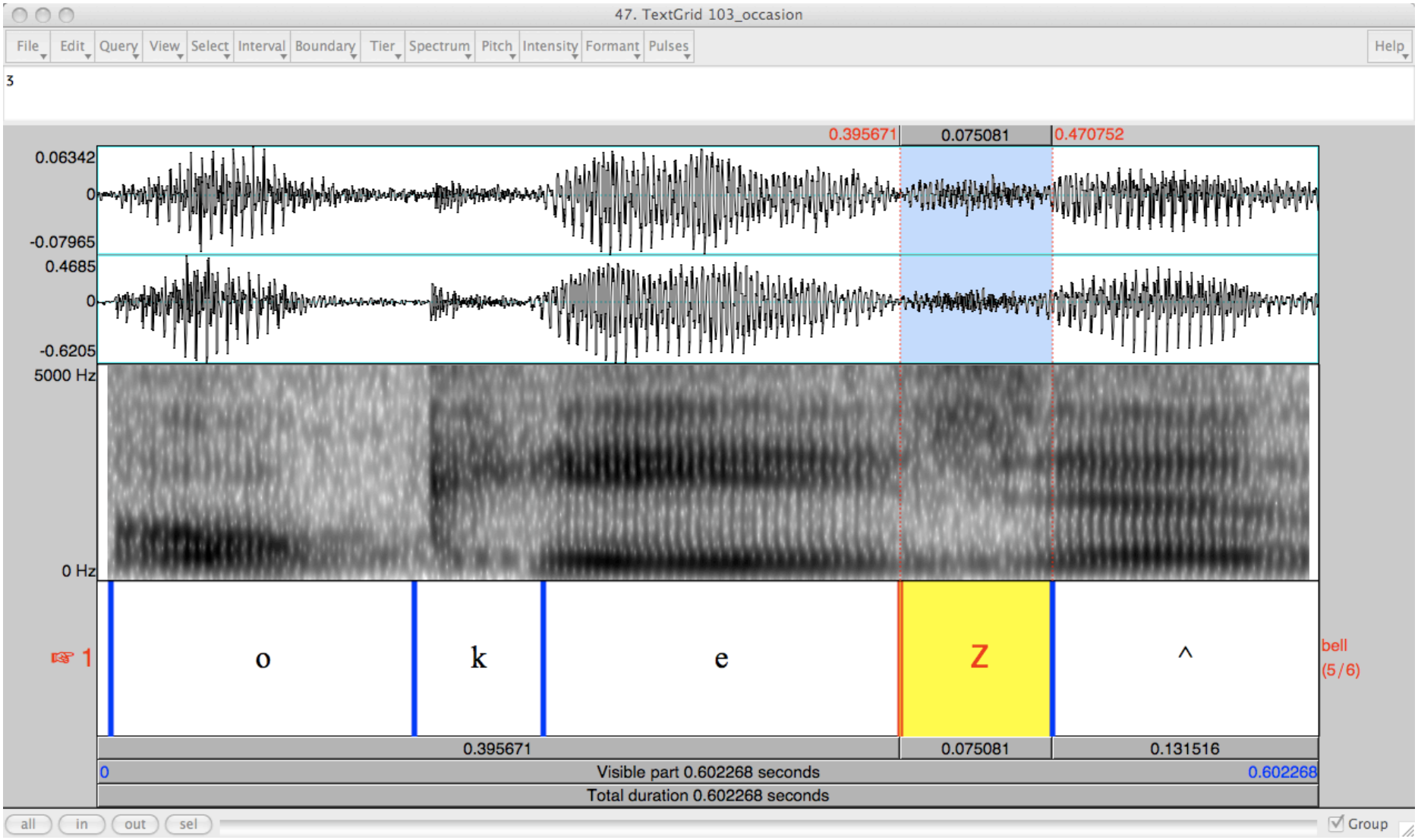


Figure 4.40 - ***An example of a voiced postalveolar fricative taken from the Bequia corpus***

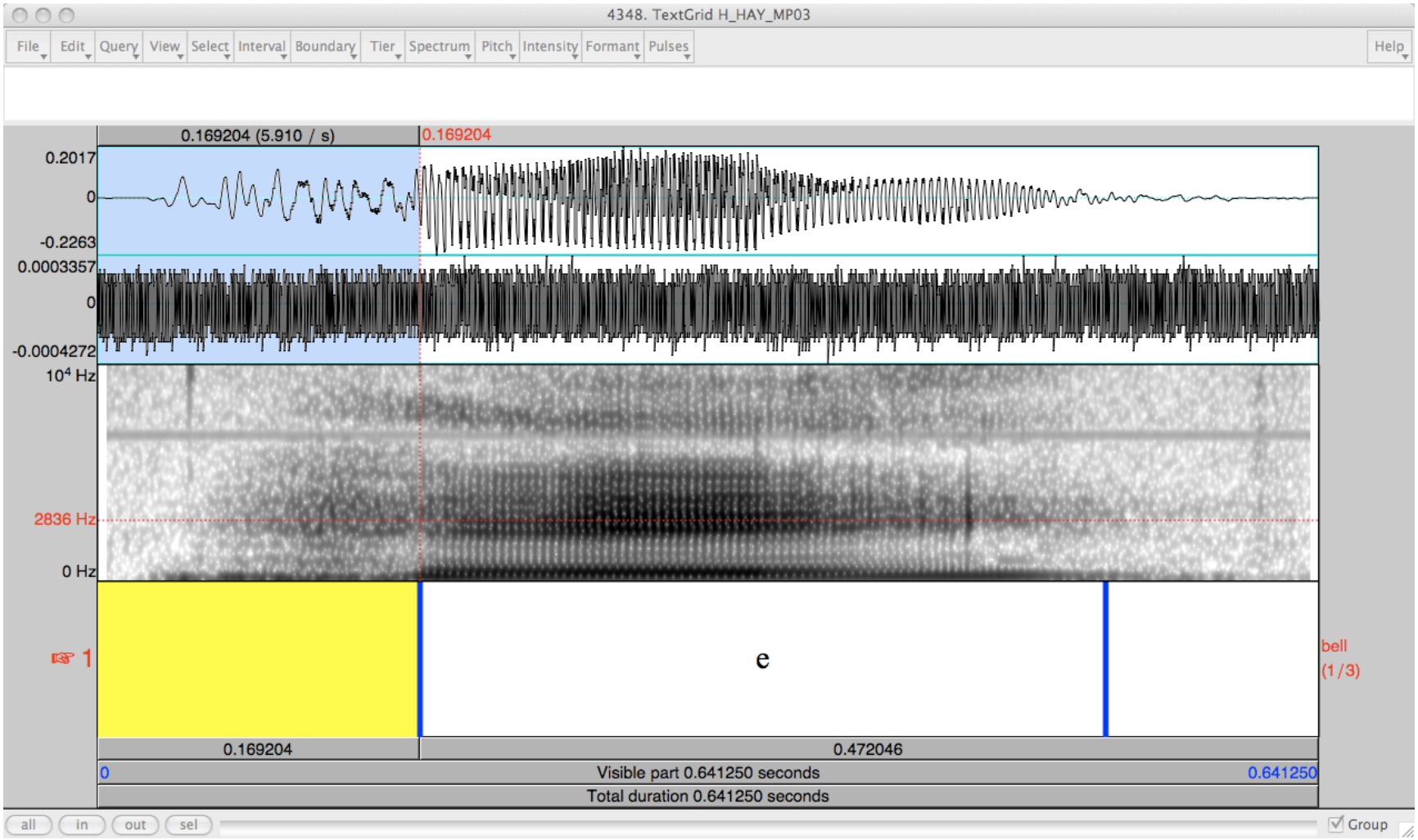


Figure 4.41 - *An example of a glottal fricative [h] in BeqC*

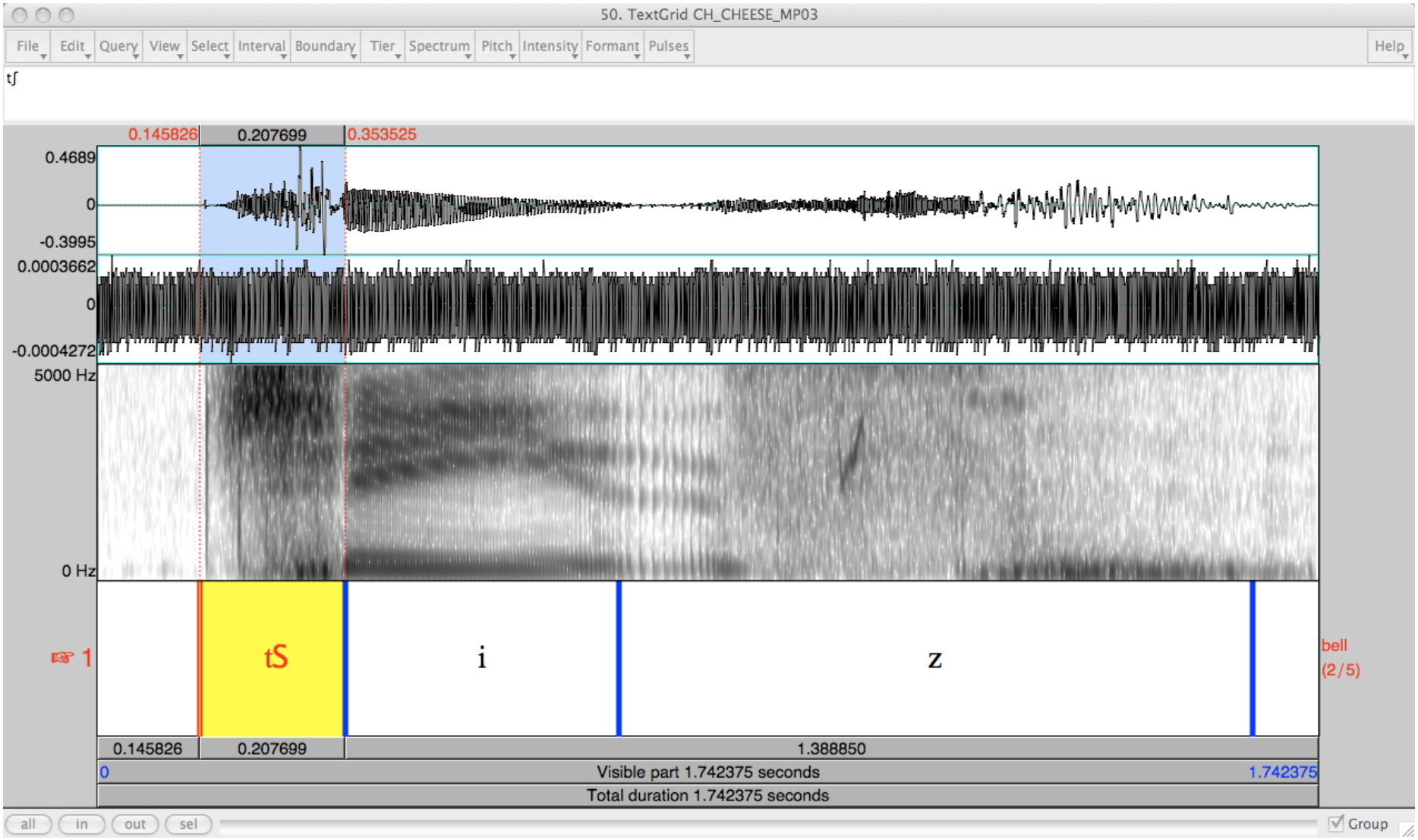


Figure 4.42 - *An example of a voiceless postavleolar affricate [tʃ] in BeqC*

Approximants and lateral approximants

Concluding the evidence for consonants in BeqC, we will present the cases for both approximants and lateral approximants in their phonemic inventory. Approximants are the complete opposite of stops, in so far as they are created by a narrowing of the vocal tract at some point instead of closure. Starting with the alveolar approximant [ɹ], the usual way to identify this is a very low third formant followed often by a quick raise to a higher level for the following segment, as demonstrated in **figure 4.43 ("*race*")**. It is very difficult to tell often how speakers are articulating the alveolar approximant without using other equipment (in this case trying to video record them as was proposed initially during the methodology but aborted when out in Bequia). Evidence collected suggests that there is a merger involving [ɹ] with [tɹ] merging into [tʃ] and [dɹ] into [dʒ], we will discuss this merger during **section 4.4.3.**

As all the picture cards had to be actual objects, acquiring a sample of the palatal approximant [j] was difficult. We had already used the word "boat" so putting "yacht" in as well, despite being a difference islanders would know was not very practical as it would likely cause confusion. This supposition is supported by evidence in the picture card data of speakers regularly getting the three examples of items relating to a persons head (hair, head and face) confused. One speaker however provided a clear token of "yacht" as shown in **figure 4.44 ("*no yachts*")** while asking a question about a different card. **Figure 4.44** shows a slight drop of the third formant, the rapid drop of the second formant and the clear rise of the first. We will discuss other potential tokens of the approximant [j] that seem to be due to the palatalisation of words like "cat" in section **4.4.3.**

The alveolar [l] was the only lateral approximant observed in BeqC and is demonstrated in **figure 4.45** ("*list*"). This stands out from other approximants based on it being generally articulated by speakers keeping the tongue close or in contact with the upper teeth or roof of the mouth and air passes round either side. What the described articulation usually means is that there is an abrupt stop in the formants with only a weak first formant, with another around 1500Hz (in this case approximately 1700Hz) and another at around 3000Hz. In certain cases, like in the example of "list", the signs are not visible but the token is still audible. This evidence suggests that the tongue position of [l] for certain speakers (spread across several

settlements) is not making complete contact with the roof of the mouth or more generally a difference in articulation from standard versions of the phoneme – this would have to be measured either by recording people saying the phoneme as discussed regarding the alveolar approximant [ɹ].

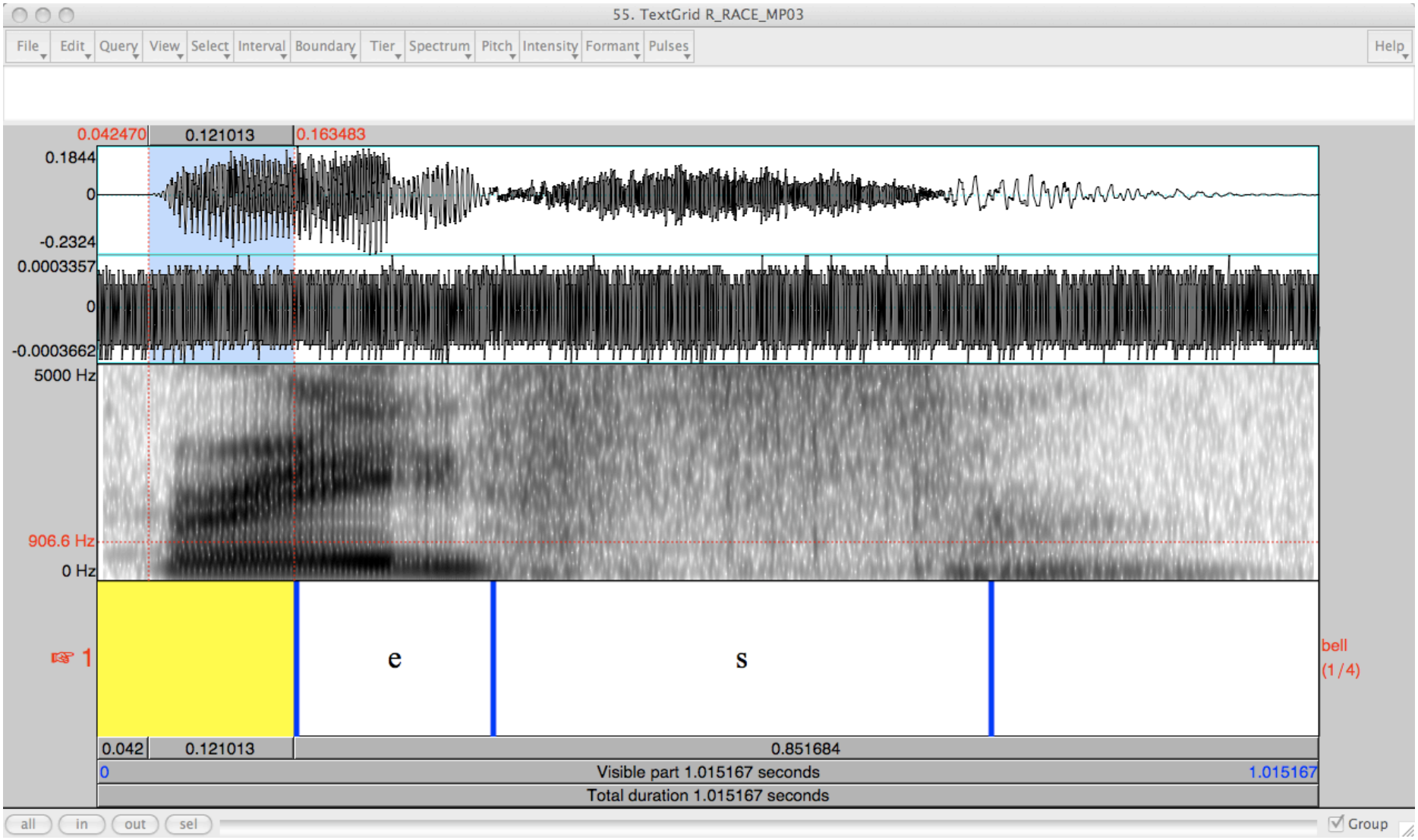


Figure 4.43 - *An example of an alveolar approximant* [ɹ] *in BeqC*

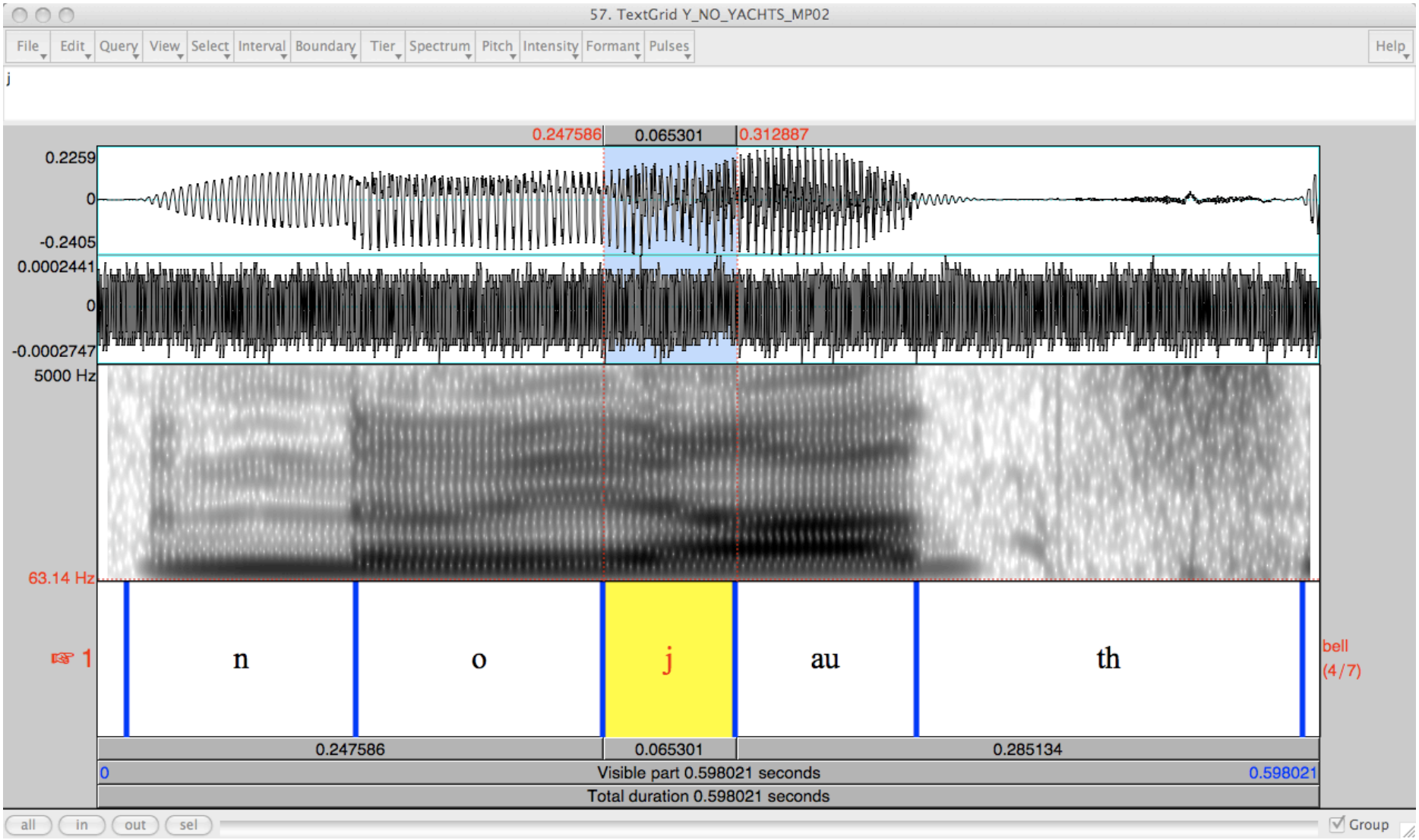


Figure 4.44 - *An example of a palatal approximant [j] in BeqC*

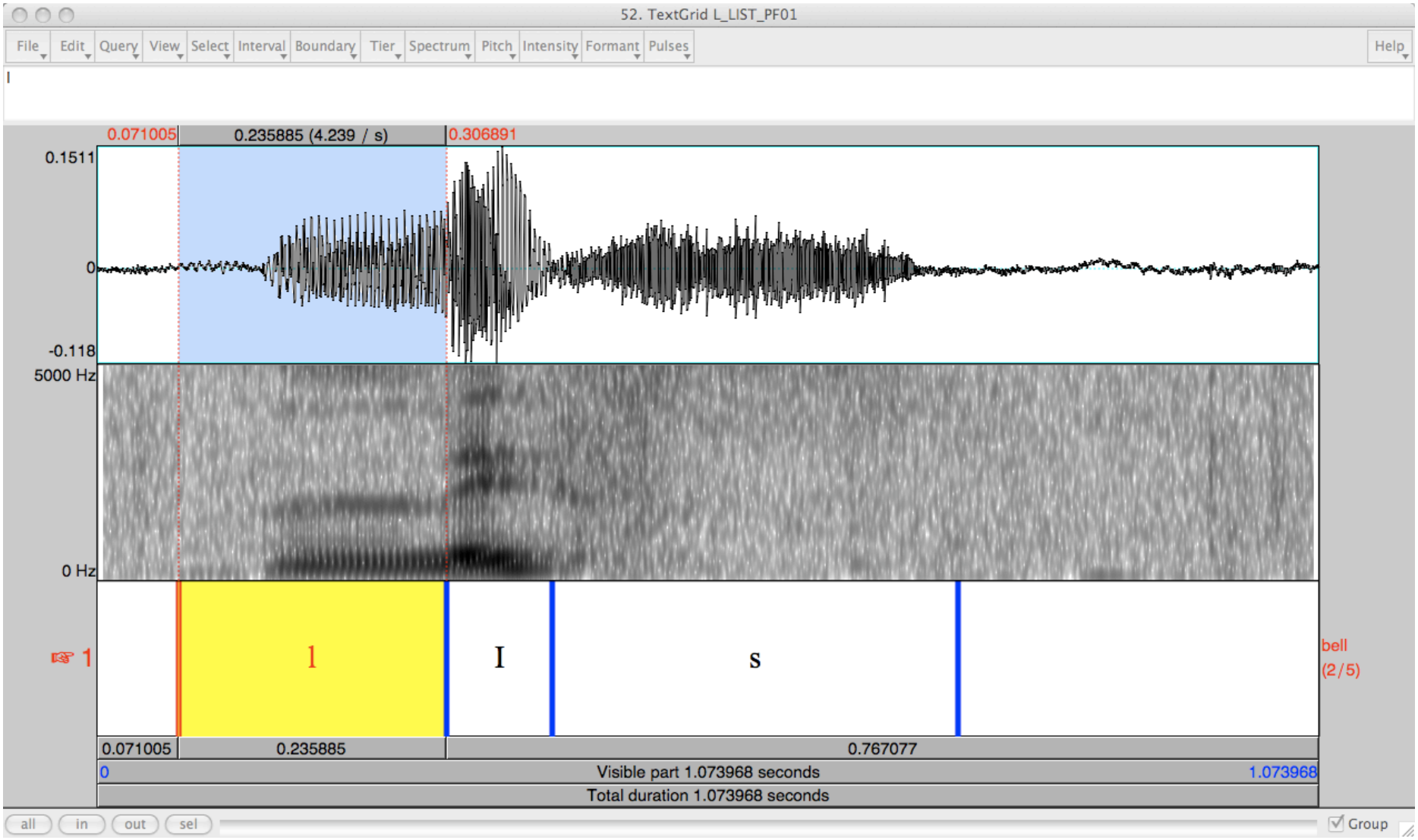


Figure 4.45 - *An example of an alveolar lateral approximant [l] in BeqC*

4.4.3 Discussion of features that affect BeqC consonants

TH-stopping in BeqC and the status of interdentals

In *Table 4.3* we marked the interdental fricatives [θ] and [ð] as being unattested in BeqC. The reason to this is twofold – one related to the picture card materials and the other due to basic sociolinguistic interviewing technique. Regarding our experimental materials, Ng (2008) gives a clear reason that even if word card material had been available, the presence of [θ] and [ð] may not have been confirmed in BeqC by the data we prepared. As discussed before, TH-stopping is the change from interdental or labiodental fricatives to plosives [t] and [d] respectively and depending on the voicing status of the fricative. According to Edwards (2004:388) "*A Handbook of Varieties of English*" TH-stopping word initially and word finally more often than word medially. Due to having to disregard the word card component of the experiment while in Bequia to procure speakers, we had little available data on the phenomen to analyze. Many examples, which would have had potential examples of interdental fricatives, were lost. To gather evidence to prove whether or not interdentals are a part of the phonemic inventory of BeqC speakers the best test would be to use words with the potential token in the middle of a word like "rather", "mother", and "father" as well as some examples word initially and finally. Where TH-stopping does not occur the goal would be to see if speakers use the labiodentals [f]/[v] or the interdentals [θ] and [ð].

Figures 4.46 ("*north*") and **4.47** ("*mouth*") from the picture card data demonstrate where both a case TH-stopping is occurring and one is not. In the two above examples there are clear plosives word finally based on the clear release of air from the mouth as opposed to a fricative where you would expect more random energy distribution as air is forced through a space in the mouth. In both **figures 4.46** and **4.47** there are examples of aspiration [t] as you can see in their spectrograms at the end of the phoneme. That is not to say that speakers do not sometimes use fricatives word medially instead of TH-stopping as shown in **figure 4.48** ("*something*") where there is a random energy distribution that resembles [v] as shown by the clear vertical striations through the marked phoneme. What differs the [v] from being a voiced interdental fricative according to Ladefoged (2001:57-58) is that the fourth formant should be below 4,000Hz for a [f] or a [v] and above that for an interdental fricative –

in the example's case it is approximately 250Hz beneath 4,000Hz. Based on the evidence available it is a reasonable proposal that the interdentals do not exist in BeqC. However, until more acoustic evidence using tokens word medially that you would expect a fricative instead of a stop are provided there is no conclusive evidence that they are not present.

The second reason that we may not have been able to establish the presence of interdentals in BeqC relates to the educational level of many of the people interviewed. Although the literacy rates on the island are low, speakers are intelligent and linguistically savvy about how foreigners based on many jobs being in the service-sector on the island. Many in our sample worked in shops and had to interact with foreigners often so are used to hearing the interdental fricatives used in words used during data collection. Given that the data had to be collected over a period of three weeks, in many cases it was not possible to build up a rapport with speakers. This leaves room for speakers to be apprehensive about how they say words and to imitate certain features of the interviewer's variety if English. Although there is a mix of races on the island a particular relevant paper is Cukor Avila and Bailey (2001), which focuses on the role the race of the interviewer plays. While there are no definitive conclusions about whether or not the race of interviewer affects in eliciting tokens it is a confirmed part of what is perhaps a larger group of factors that affects how speakers respond to the interviewer. Therefore even if we received examples of interdentals from speakers, the combination of lack of a rapport with subjects and time on the island would throw into doubt whether collected tokens were good evidence.

There is one other possibility to test for the presence of the interdentals – particularly in the alleged highest prestige variety of BeqC from Mount Pleasant. Wells (1982: 565) points out that educated speakers tend to be very level in their usage of fricatives and their TH-stopping and as this area is the best educated in Bequia there is a chance to test if speakers use an interdental or a labiodental fricative. Another point raised by Wells (1982: 565) is that it is possible that to some extent hypercorrection may occur in anglophone creoles. Consequently it would be worth checking if any hypercorrection occurs in the Mount Pleasant variant of BeqC as they are the most likely to be aware that they should be using a fricative instead of a stop in certain places such as in words like "foot" which could become [fuθ] or [fuf] in BeqC

depending on which interdental was used. Based on the evidence collected in Bequia though hypercorrection of this nature does not seem to occur in BeqC although more conclusive evidence is still required to prove this either way.

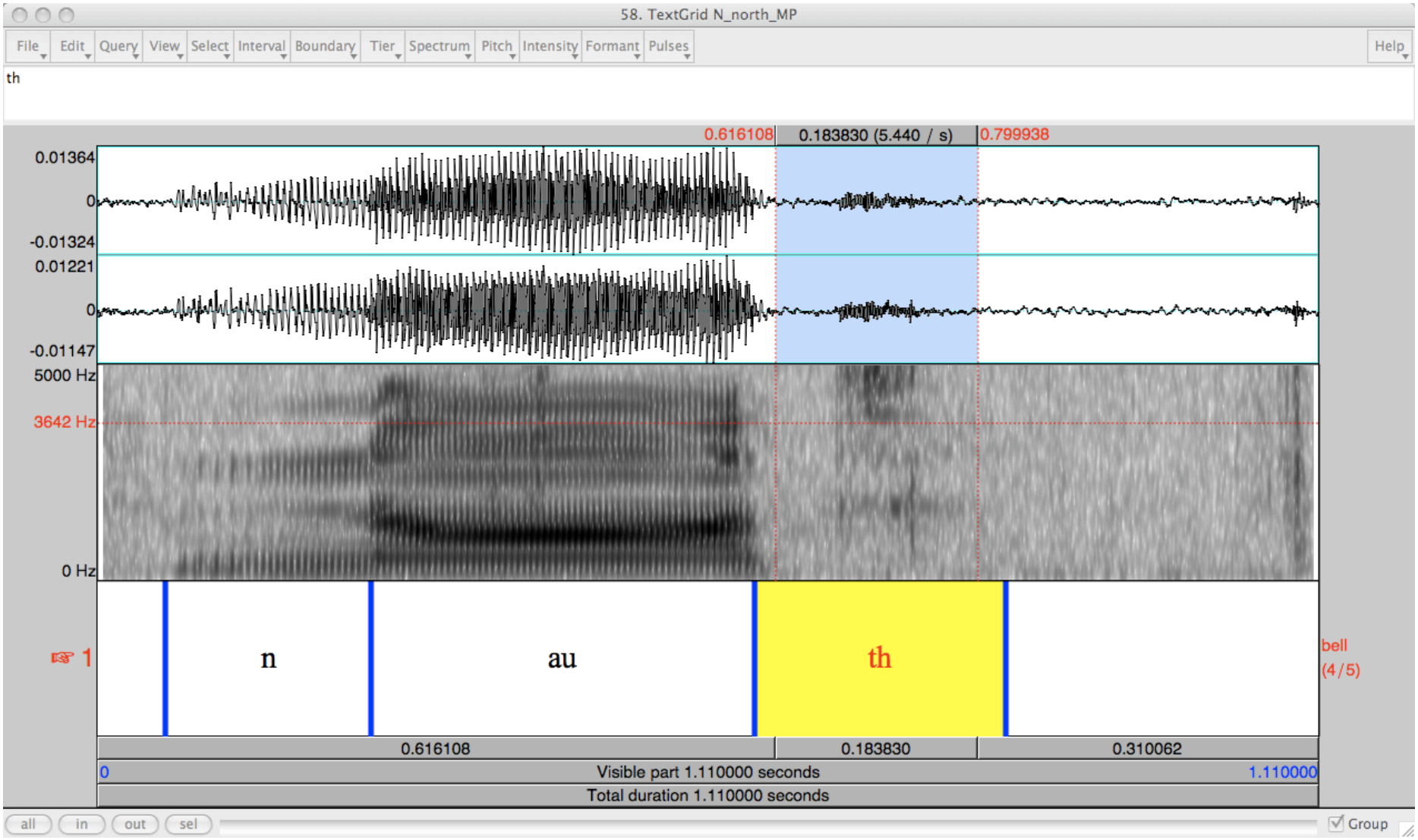


Figure 4.46 - *An example of an TH-stopping in BeqC*

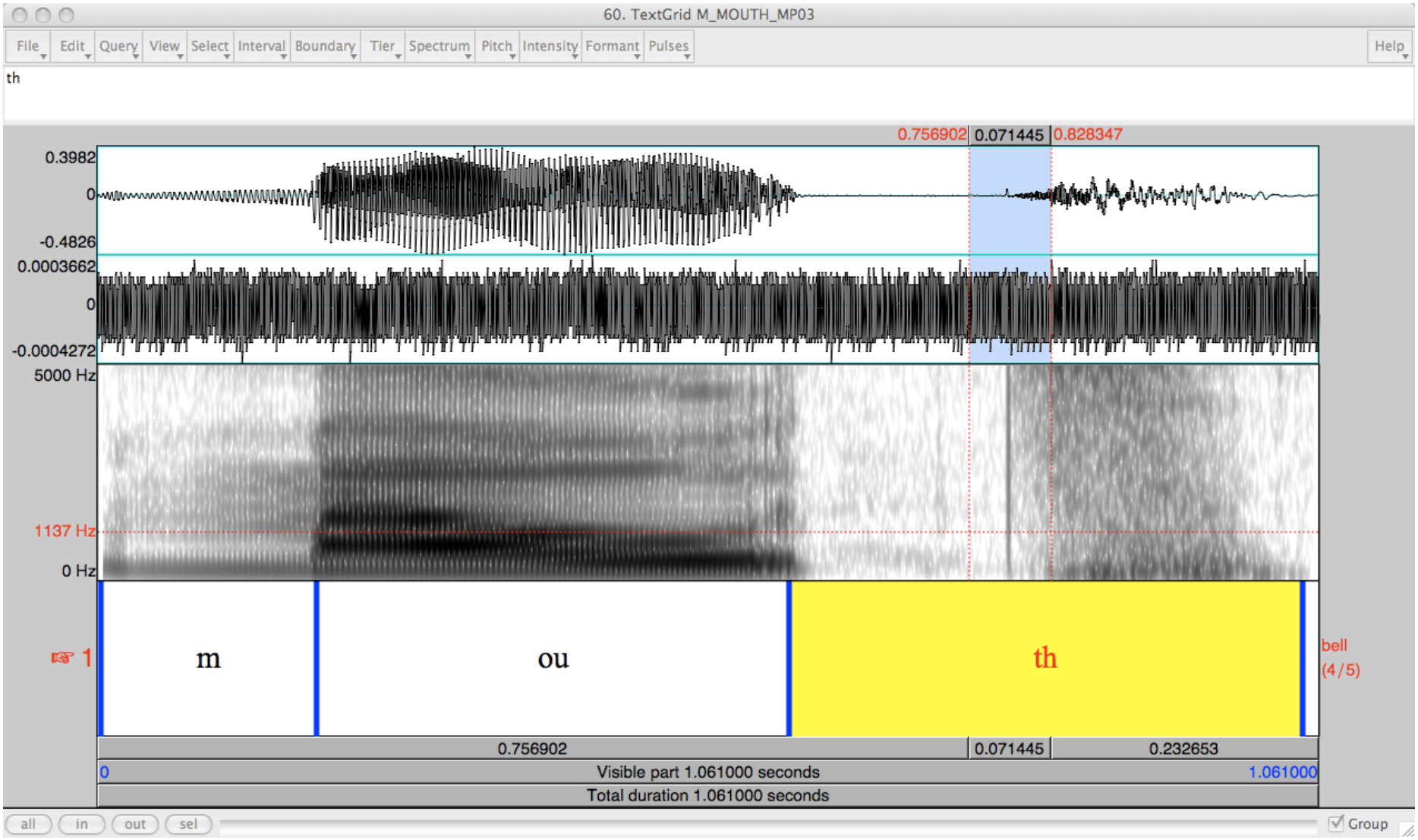


Figure 4.47 - *An example of TH-stopping in BeqC*

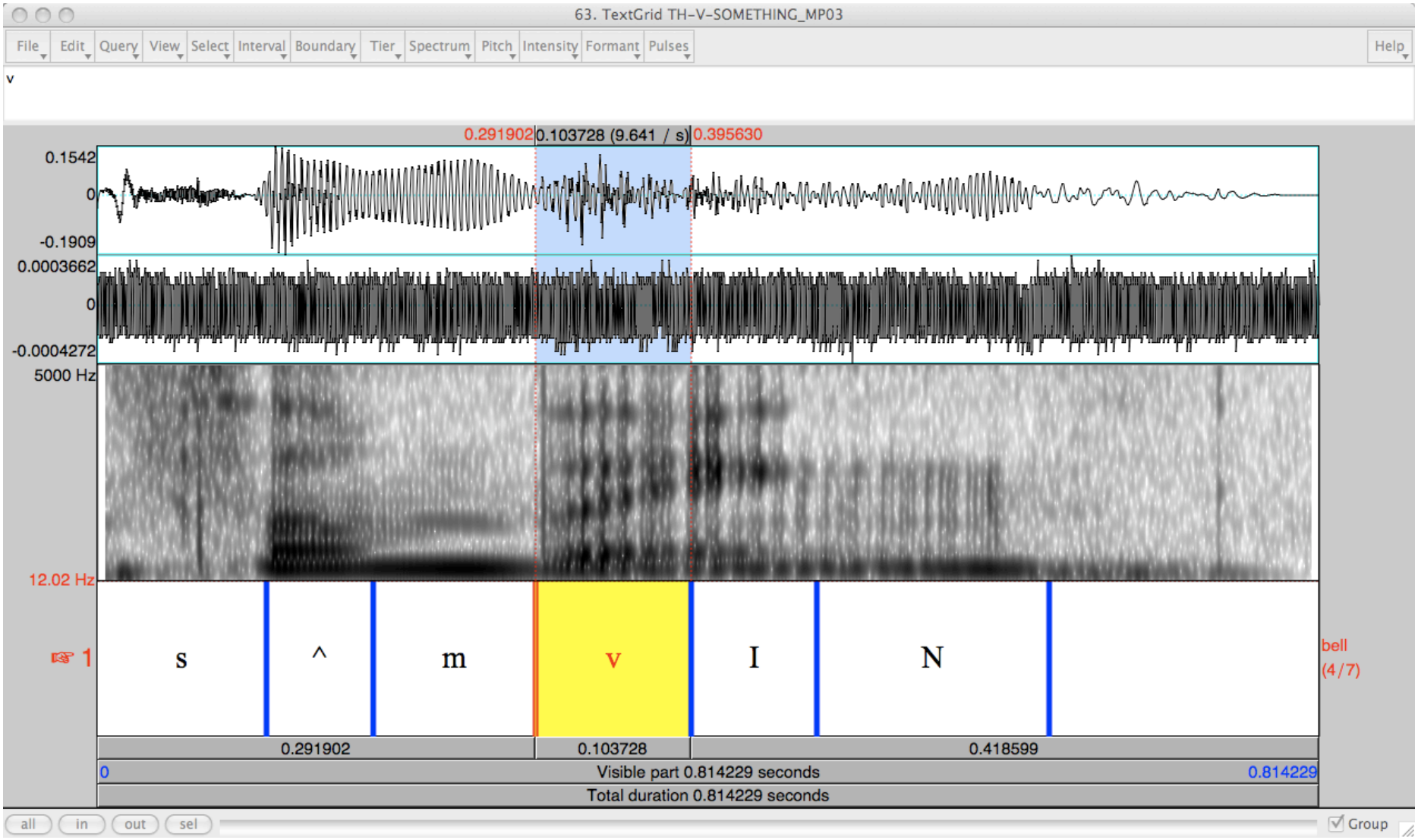


Figure 4.48 - *An example of a fricative instead of TH-stopping in BeqC*

The deletion/partial articulation of plosives word finally in BeqC

While searching for evidence of stops word finally, we found what initially appeared to be an optional process deleting bilabial and alveolar stops word finally. As we will demonstrate though, what appears to be happening in BeqC is not an optional process that deletes bilabial or alveolar stops word finally, instead only partially articulates the consonant. **Figures 4.49** ("*rip*") and **4.50** ("*to do list*") demonstrates what when listening to the audio recordings appears to be deletion of [p] and [t]. If you look at the final formant trajectories for the vowels you can see them curving as you would expect for [p] and [t] respectively however there is no release word finally. This is a relatively common occurrence in varieties of English as the vocal folds are closed tightly shut during the articulation of word final consonants such as the two above as pointed out by Ladefoged (2005: 53).

To be clear as in BeqC, like most varieties of English, [b] is not used often word finally for objects – therefore we cannot verify if speakers do this with [b] word finally or not.

Optional devoicing of [z] word finally:

As discussed while examining the evidence for alveolar fricatives in BeqC, we discussed the optional devoicing process that appeared to be occurring for the voiced alveolar fricative [z], making it into [s] word finally. As demonstrated in **figure 4.51** ("*bees*") you can see a clear example of the voiceless alveolar fricative due to the lack of any vertical striations in the waveform that would signify vocal fold vibration. Looking across speakers this is occurring in each area of Bequia, so it is clearly not an area-specific occurrence. Evidence suggests that if a process is taking place in BeqC to devoice word final [z] then it is an optional process. This is demonstrated by one speaker from Paget Farm in **figure 4.52** ("*bees*") here you can see that there are clear signs of vocal fold vibration during the initial part of the fricative. Given the above evidence and description of the phoneme in BeqC, this is consistent with voicing that would be expected for [z].

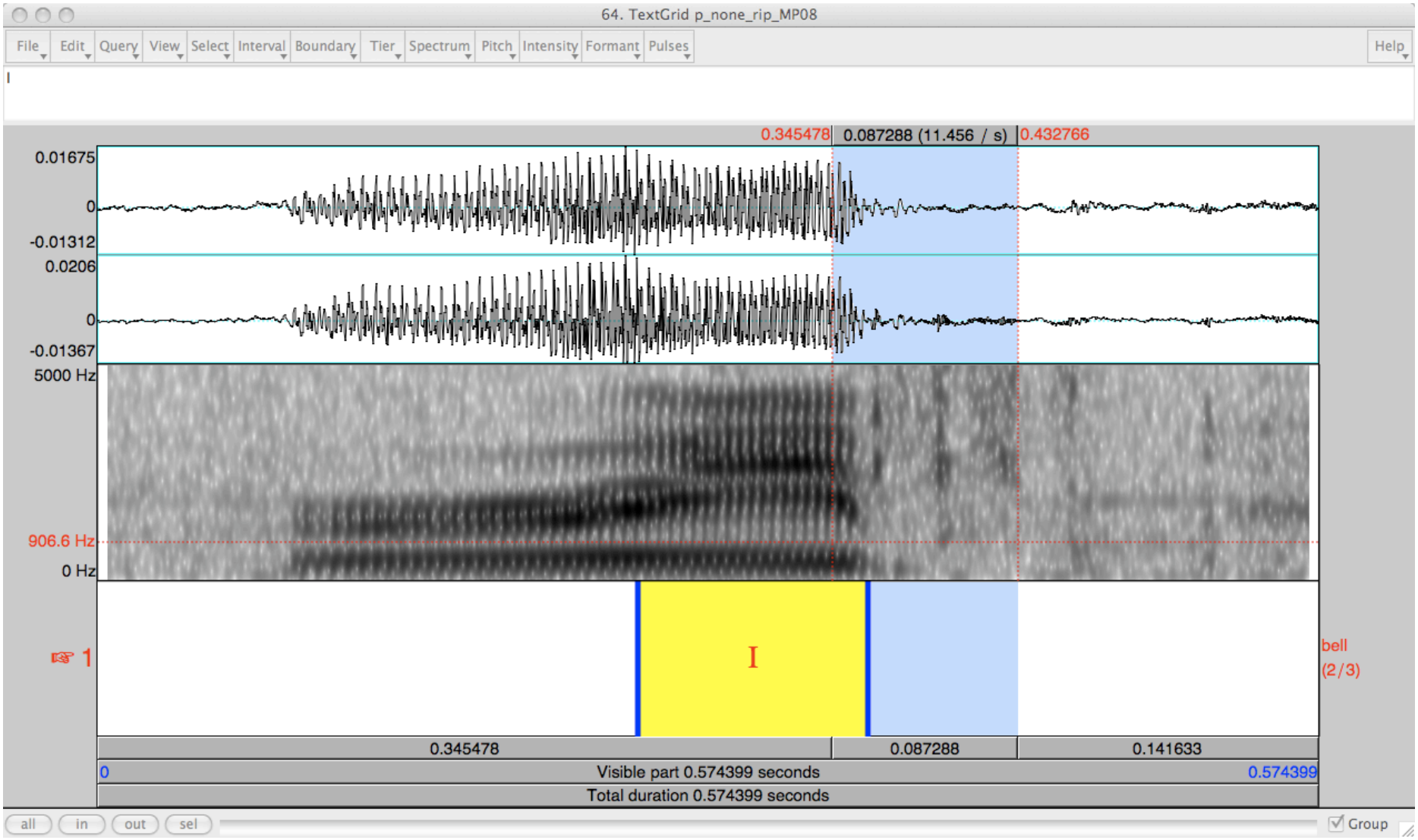


Figure 4.49 - *An example of word final partial release of consonants*

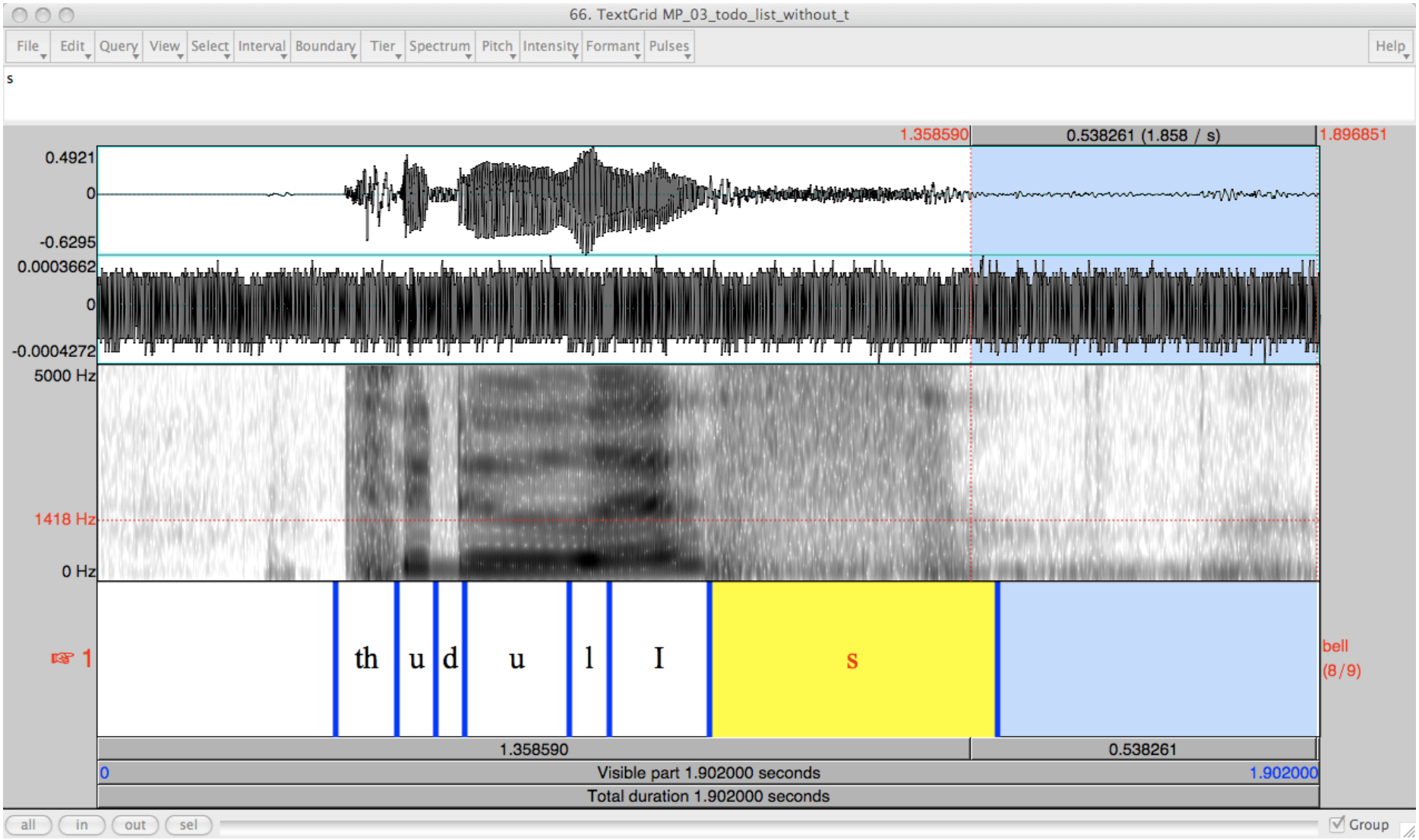


Figure 4.50 - ***An example of word final partial release of consonant***

One question that has been raised by this occurrence as well as the issue when we first suspected stops were not being articulated word finally is are these elements part of BeqC speakers phonetic realizations or not? More specifically: Do many speakers intend for there to be a word final [z] at the end of "bees" or do they actually intend for there to be a [s] instead? We need to consider whether there is an optional devoicing process in place as we discussed above or if the majority of the islands speakers just use [s] word finally for words like "bees", "houses" and "fleas" instead of [z]. To test this conclusively we would need a more comprehensive sample of speakers with a selection of words that end with [z] both as listed above and others like "sleaze" to see if speakers naturally use [s] or if they only replace [z] in some instances.

*Palatalisation in BeqC**:***

Palatisation of words where a velar stop is followed by the low central vowel [a] produces what sounds like [kja] and [gja] instead of [ka] and [ga] has also been observed in the Bequia. The two words this was most noticeable happening to on the island were "girl" and "cat" and is demonstrated in **figure 4.53** ("*cat*")**,** sadly we did not have a picture card for "girl" as the extent of the phenomenon was only realized upon arrival on the island. **Figure 4.53** demonstrates how one speaker who is particularly at ease speaking to the interviewer produces what looks like a [j]. During the highlighted piece of **figure 4.53** the second formant can be seen falling initially as [a] begins while the first formant can be seen rising, consistent with [j] BeqC.

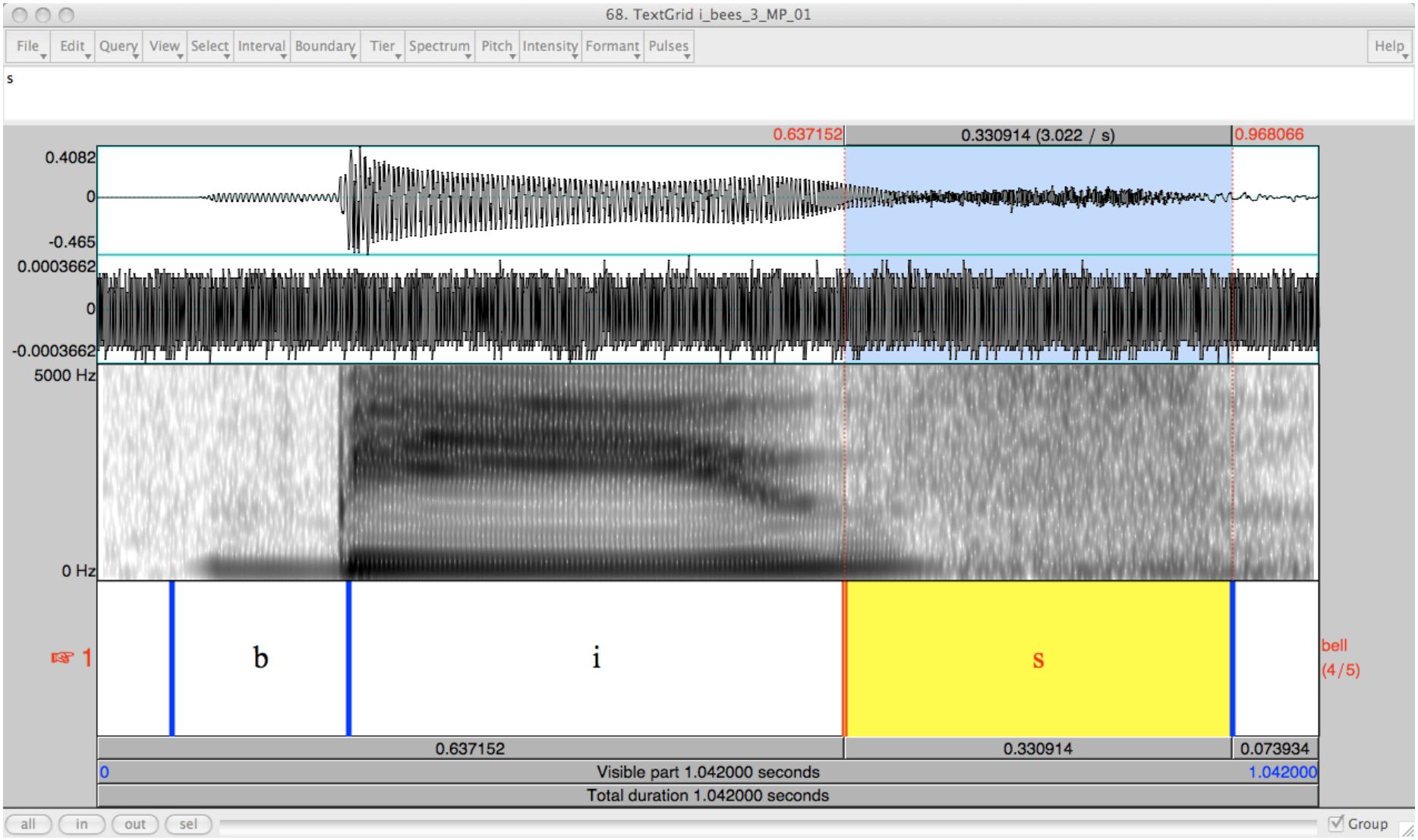


Figure 4.51 - ***An example of word final devoicing of [z].***

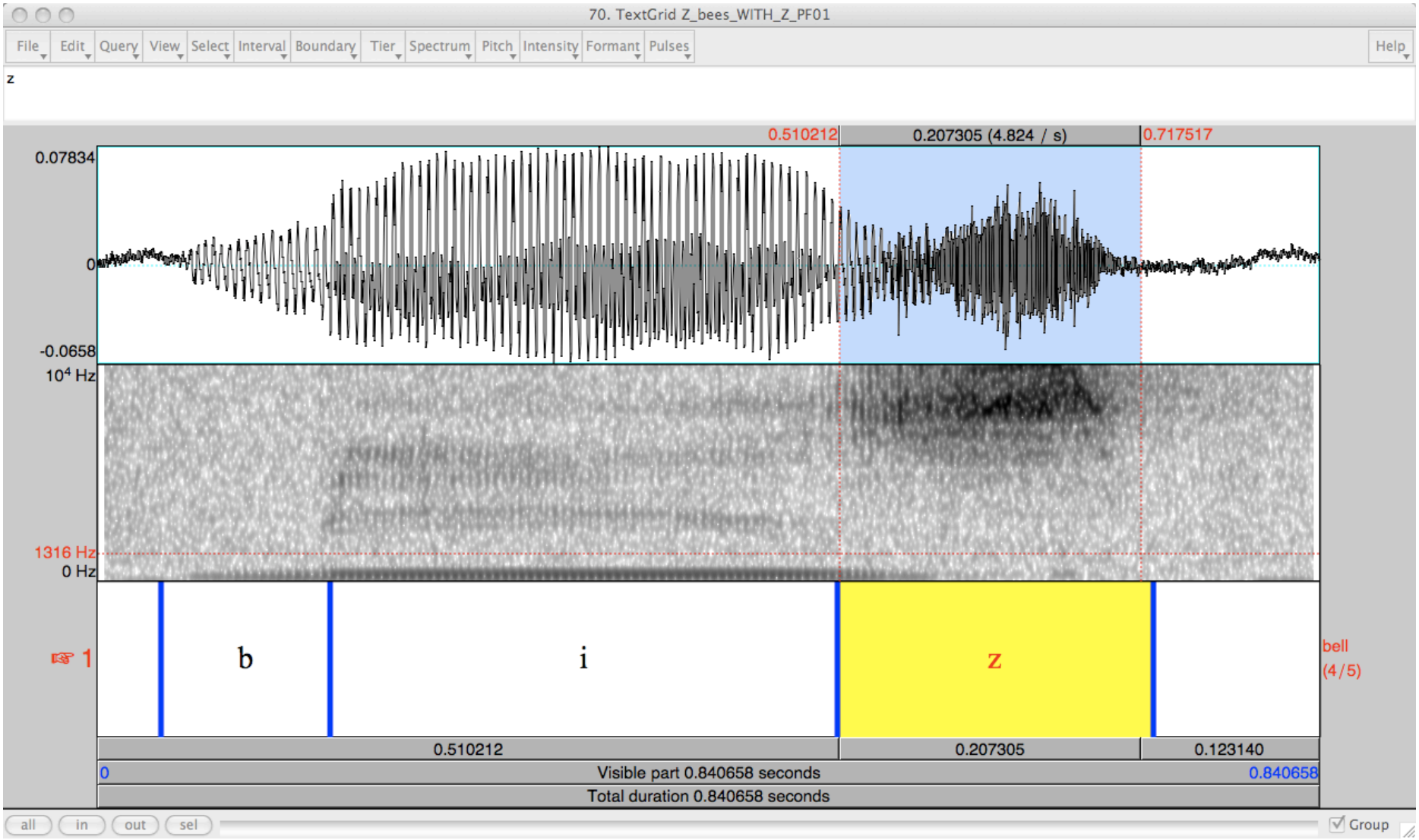


Figure 4.52 - *An example where word final devoicing of [z] does not occur.*

This palatisation happens in relaxed speech with either residents of Bequia or people the residents consider themselves to be comfortable talking to though. Sometimes during interviews if speakers had either a good idea of how "cat" should be said or felt they should be trying to copy the way the interviewer spoke they would often try to reduce the process. **Figure 4.54** ("*cat*") shows an example of the token taken from a speaker who was well educated and ran a local business that meant they interacted with tourists on a regular basis. As you can see in **figure 4.54**, where the initial [k] appears to be aspirated and while you can see what appears to be similar to palatalisation but there is no audible [kja] occurring during articulation.

As discussed, the likeliest reason for this occurrence in BeqC is that speakers are adding the palatal approximant [j] due to the movement from [k] or [k^h] to the low open central vowel. This is opposed to because speakers are including the phoneme as part of their realization of words beginning with a velar stop as well as [ka] or [ga], making the initial vowel palatalized by speakers of BeqC. In support of this theory as opposed to something unusual related more generally with plosives before a low central vowel. The [j] sound does not occur with other plosives as far as can be ascertained from tokens as shown in **figure 4.55** ("*bat*") which shows no sign of a j word initially when you look at the formant transition at the start of the vowel. Assuming this is occurring with only velar consonants as well there – it also does not appear to occur with closed vowels either, as evidenced by words such as "*gun*" being pronounced as [g^n] in BeqC as opposed to [gj^n] for example.

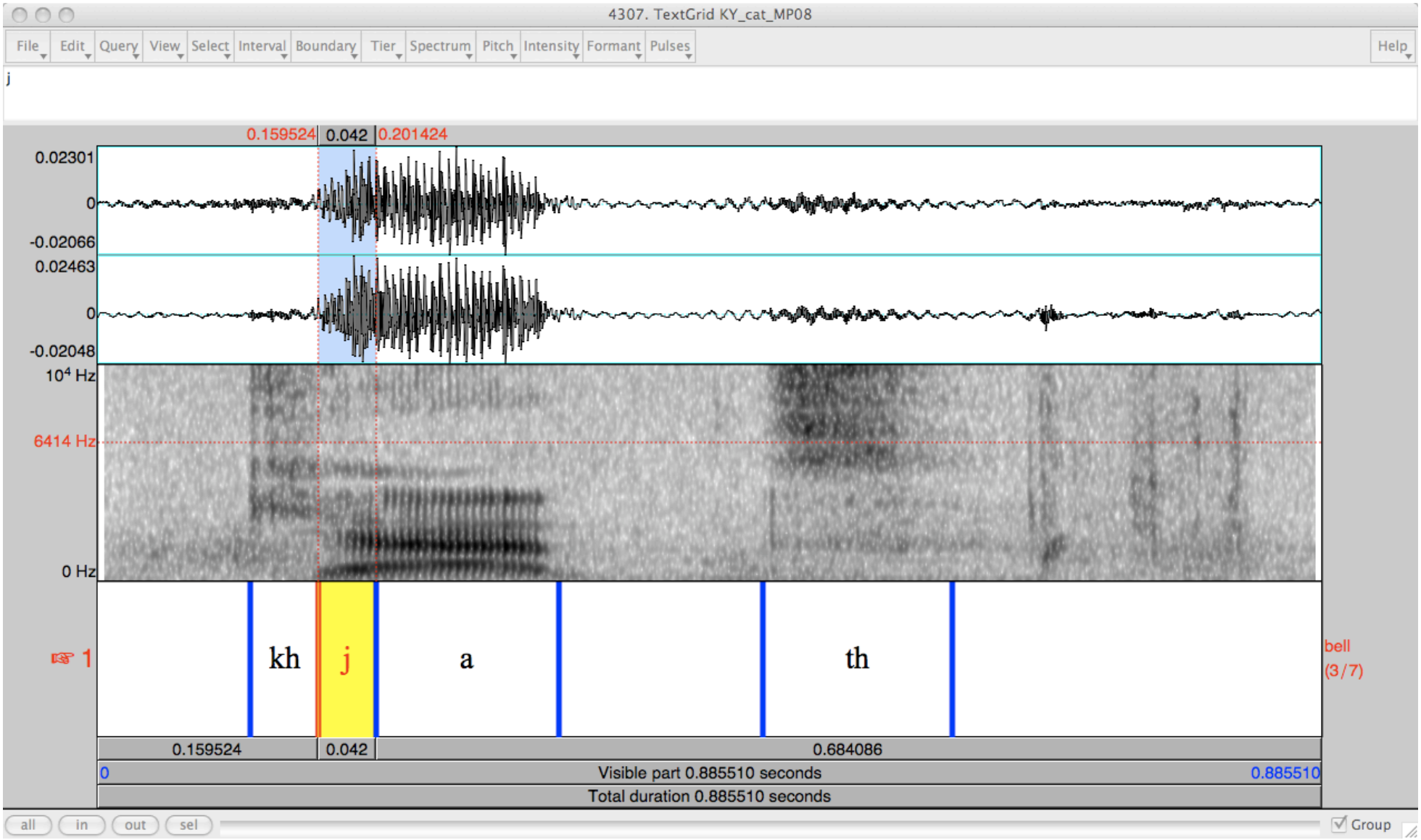


Figure 4.53 ***An example of palatization in BeqC with a velar plosive in BeqC***

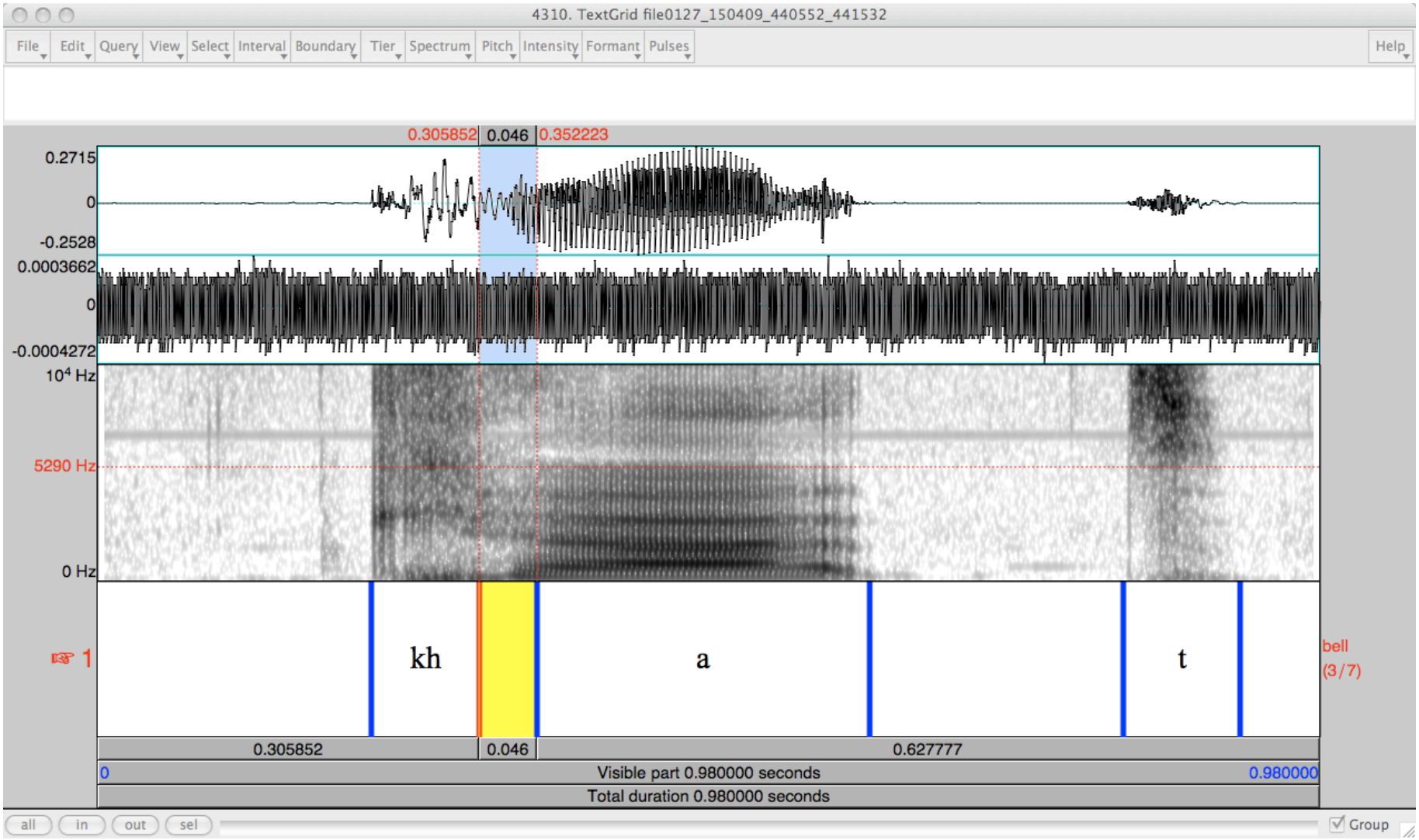


Figure 4.54 - *An example of potential palatization in BeqC with a velar plosive in BeqC*

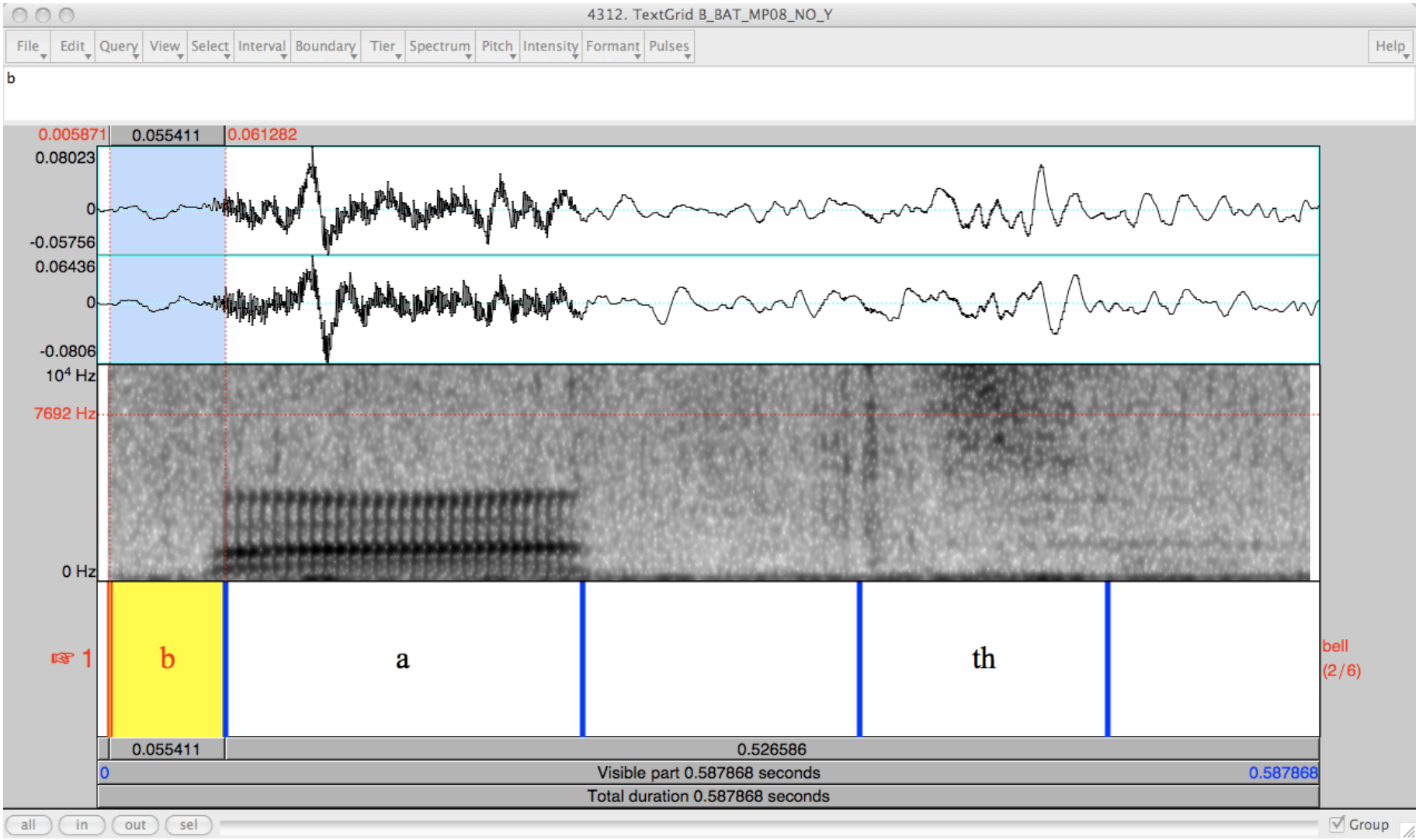


Figure 4.55 - *An example of palatization not occurring with a bilabial plosive in BeqC*

-R interaction with consonants and vowels in BeQC

During section **4.3** we observed that the word "beer" changed the [i] vowel into an [ɛ] in BeqC. As we found during our analysis of word initial and final clusters involving [ɹ] the realization of consonants as a part of consonant initial clusters in BeqC are also altered by its presence too.

Looking at an example of "beer" first in **figure 4.56** you can see how the formants for this differ from a regular [i] as shown in **figure 4.52.** Apart from surface differences, the exact formant frequencies place the vowel within [ɛ]'s range as opposed to the speaker's [i]s. To perform a fuller statistical test other words that could be affected like *deer*, *fear* and *gear* for example should be collected then from speakers. If the difference proved to be significant then it would demonstrate that when interacting with [ɹ] that a different vowel is used.

In word initial consonant clusters such as [tɹ] and [dɹ] there are other noticeable changes caused by [ɹ] interaction. Particularly noticeable in the corpus data for [tɹ], where a merger was observed in words such as "tree" from [tɹ] to [tʃɹ] as demonstrated in **figure 4.57** ("*tree*") from the data collected while in Bequia. As the spectrogram in particular shows, you can see the random energy as you would expect for the fricative [ʃ] between the two other elements of the consonant initial cluster proving [ɹ]'s effect on alveolar voiceless stops. Evidence suggests that the [ɹ] does not affect aspirated word initial alveolar voiceless stops though as shown in **figure 4.58** ("*three*") which shows TH-stopping in progress word initially resulting in the speaker of BeqC providing an aspirated [t] word initially instead, this does not produce a [ʃ] in the initial consonant cluster. For the interviewer this proved confusing initially as it meant that "three" sounded more like "tree" to a foreign listener than "tree" in BeqC did.

We also examined the voiced alveolar stop [d] word initially to see if a similar interaction occurred word initially when before [ɹ] in words like "*drink*", "*drum*", "*drank*". Initially the corpus data suggested that speakers across BeqC pronounce "drink" as just [dɹInk]. However when out in Bequia we discovered evidence to suggest that some speakers in our sample did articulate [dɹ] as [dʒ] although we were

only able to get a proper sample across speakers for the word "drum", observed before with phenomenon like TH-stopping due to word cards not being usable in Bequia. ***Figure 4.59*** *("drink")* shows one example of a speaker from Hamilton performing [dʒ] when articulating a word which based on other areas of Bequia you would expect a [dɹ] to occur. As you can see from the initial consonant cluster in the word, there is a stop initially that, as usual for an affricate, is difficult to see anything in, followed by a postalveolar fricative which is evident on the spectrogram in ***figure 4.58***, being shown on a scale of up to 10,000Hz, and demonstrating a band of energy which stretches up to the

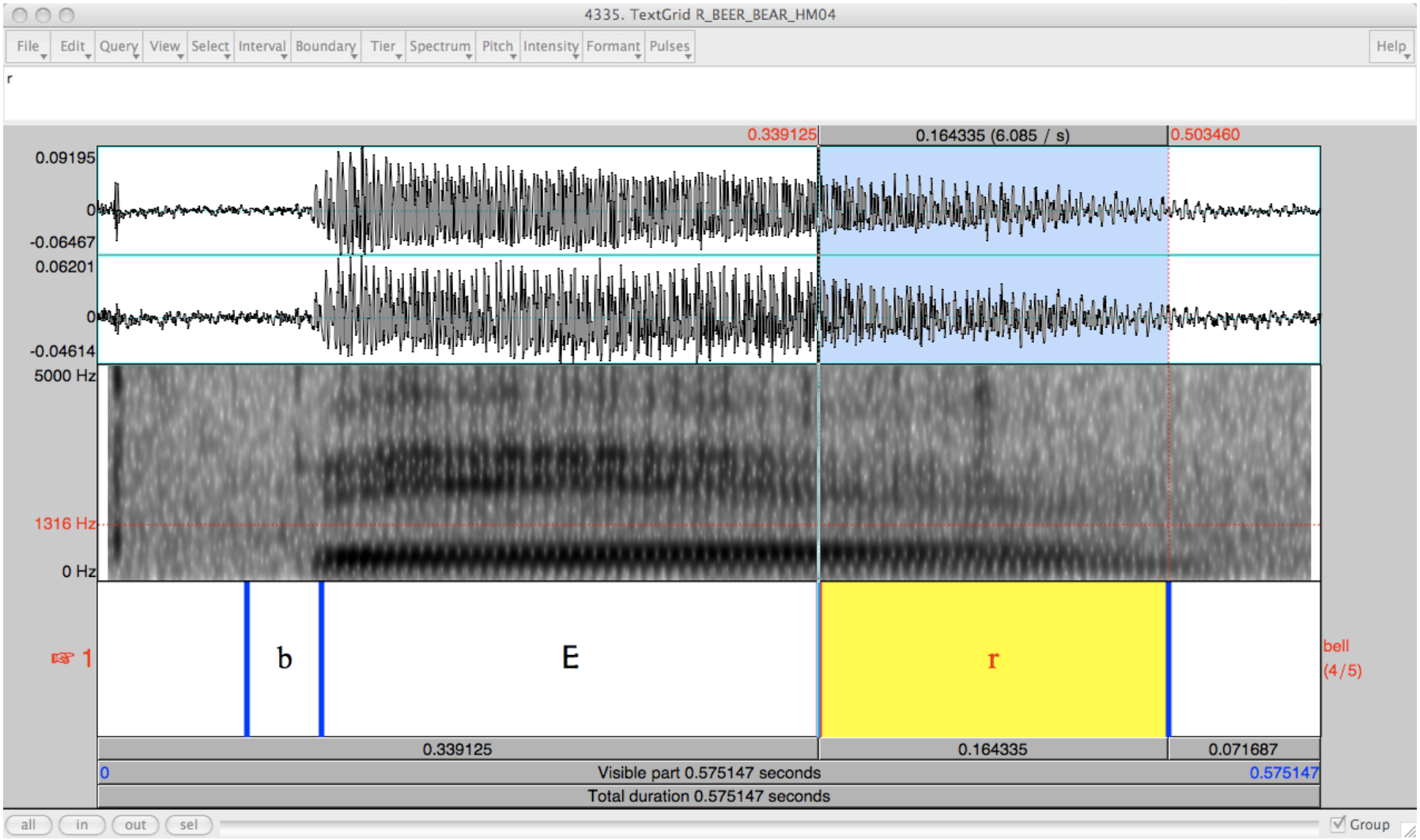


Figure 4.56 - *An example of [i] being effected by the following segment.*

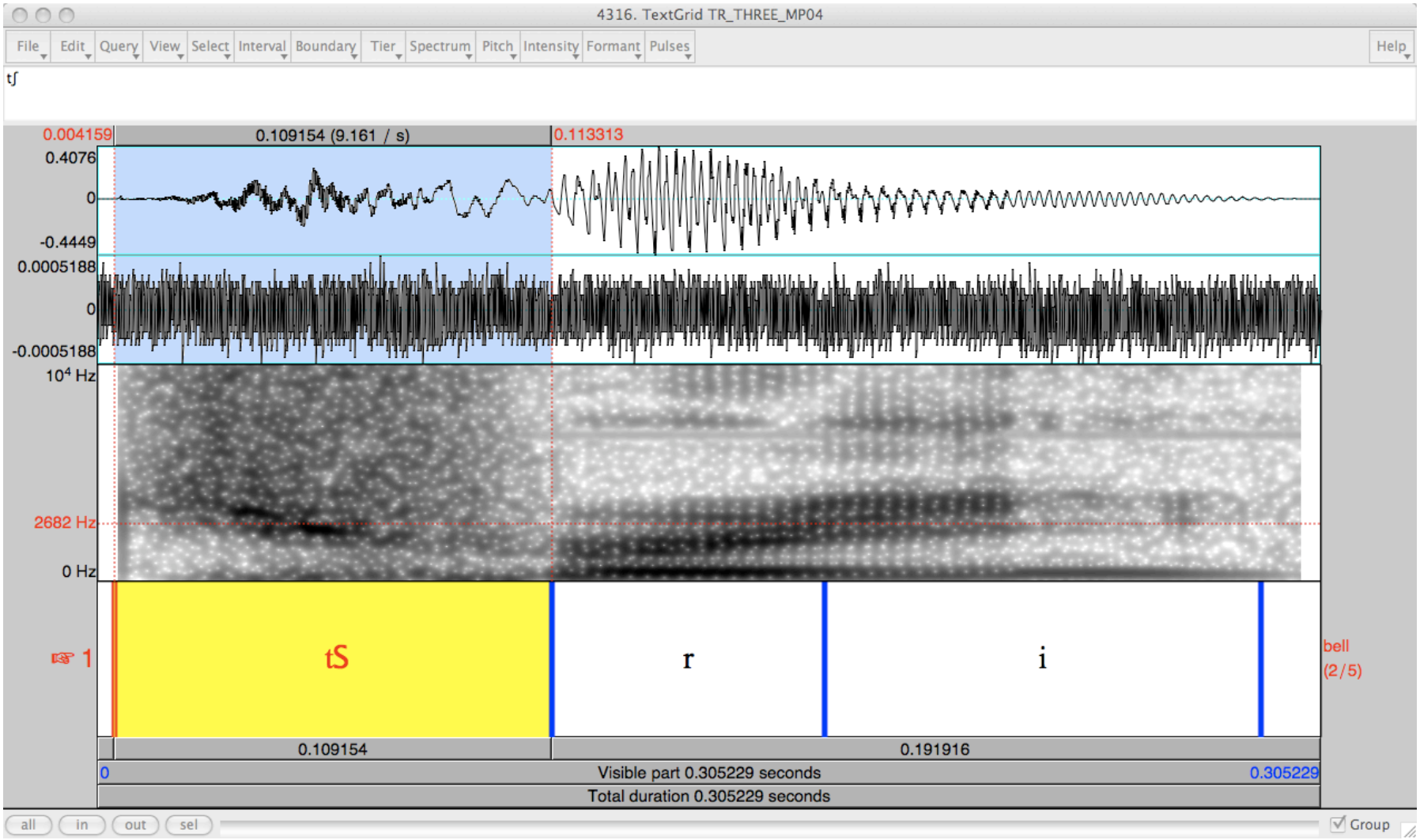


Figure 4.57 - *An example of* [tɹ]*becoming* [tʃ ɹ]*in BeqC*

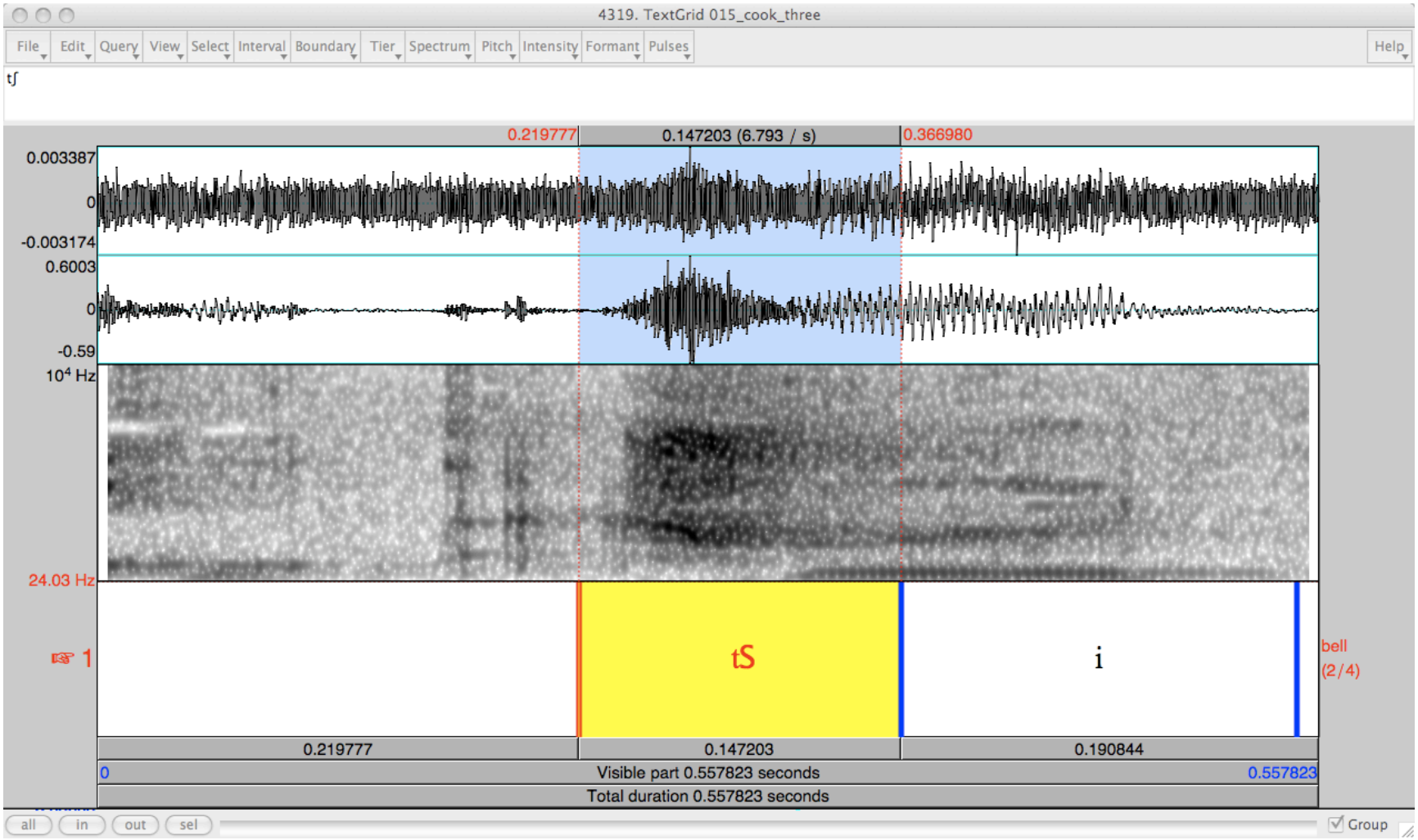


Figure 4.58 - *An example of the word "three" in BeqC*

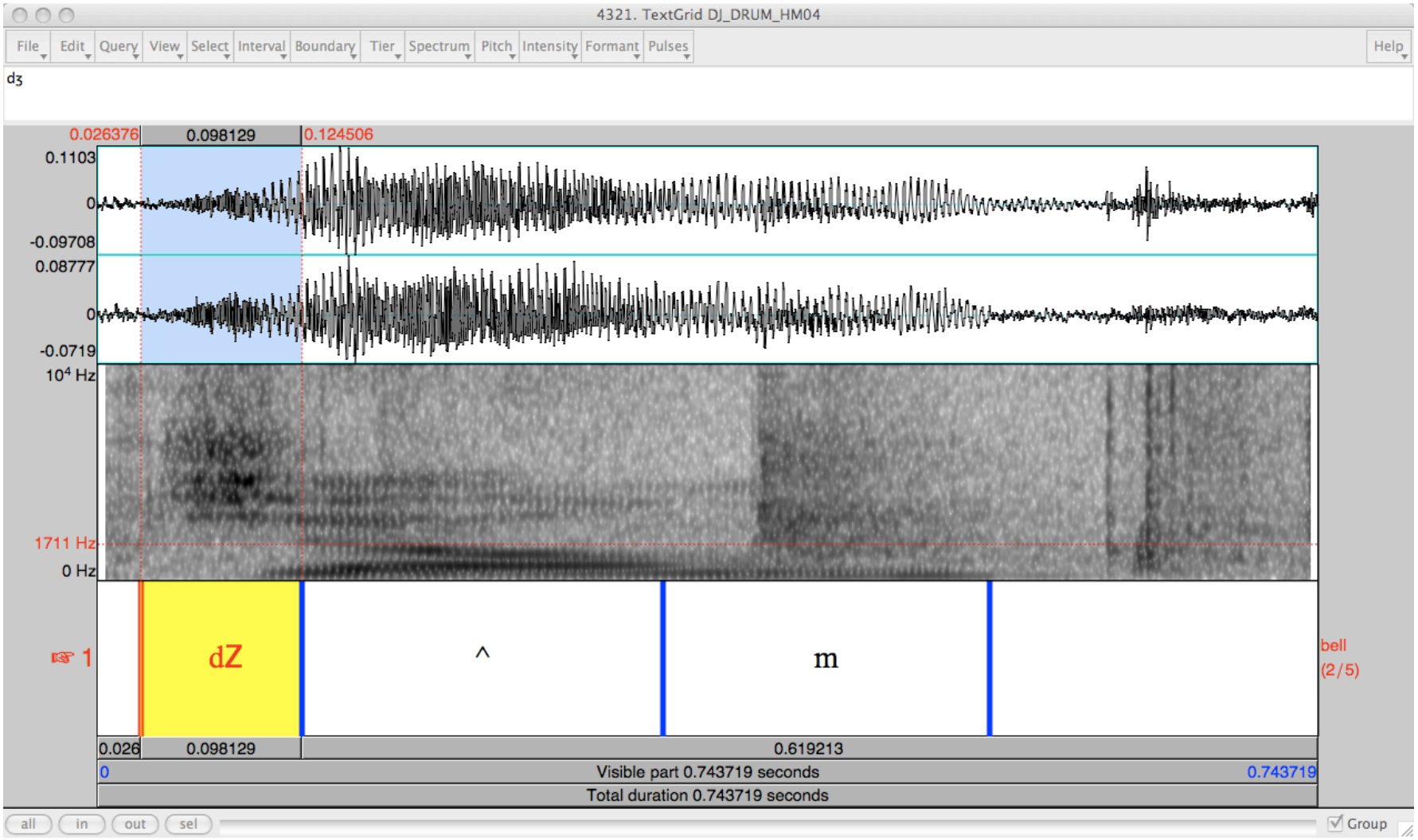


Figure 4.59 - *An example of the word initial cluster in "drink" becoming* [dʒ] *in BeqC*

We have not been able to find any evidence of similar occurrences with other stops in BeqC like [bɹ], [pɹ] or [gɹ] for words like "bread", "prize", or "grey". While this is not conclusive proof that [ɹ] does not affect other word initial consonant clusters, at present our findings suggests that only alveolar plosives are affected.

Rhoticity in BeqC

After discussing the –r interaction with other elements word initially and word finally in BeqC, there is one crucial area we still need to address: the status of rhoticity in BeqC. To address this we examined several examples where [ɹ] occurs word finally in the data we collected such as "*cat*", "*cart*", "*hat*", "*heart*" and potentially words like "beer". If BeqC is a rhotic dialect one would expect to find that word finally the F3 value for the vowel before a word like "heart" or "cart to remain relatively stable (i.e. flat) and then to drop word-finally.

One of the biggest issues with examining rhoticity in BeqC is the lack of minimal pairs tailored this task. Ideally a minimal pair such as "paw" and "poor" would have been ideal for this, as one historically has never contained a [ɹ] word finally whilst the other has. As we lacked this though words that are not minimal pairs such as "hat" and "heart" had to be used in their place.

After examining tokens across speakers of BeqC it was concluded that evidence for and against BeqC being rhotic was present, based on an examination of the available data as well as examining the vowel space of BeqC and the status of certain words in BeqC that interact with [ɹ]. As shown in **figure 4.60** ("*heart*") showing a speaker using a word typically containing an [ɹ], you can see the formant pattern for F3 we described above if a speaker had a rhotic accent, due to the drop in the third formant after the vowel. This was observed across speakers on the island and would indicate that BeqC is rhotic across speaker groups assuming that the words examined would not have [ɹ] usually in a non-rhotic accent, something that is questionable with words like "heart" and "cart" which could use a lengthened [ɑ] vowel instead of [ɹ] across speakers. We will discuss how this finding differentiates BeqC from other dialects close to the island such as VinC in section **5.2**.

Looking at the vowel space of BeqC, Wells (1982) points out that in anglophone Caribbean creoles you would expect extra vowels to be present to compensate for the lack of rhoticity in a dialect. Wells gives an example of Bajan, a rhotic dialect, describing the non-rhotic creoles as having extra vowels compared to other languages to compensate for the lack of a rhoticity including [ɛ:] as well as a vowel described as [oa] as in "force" or "cure". While in BeqC there is no particular evidence of the [oa], there is not only an [ɛ:] in BeqC as would be expected in most dialects of English but it is used in words like "beer" for certain speakers making it sound very similar to what we would expect "bear" to sound like. As this was not an anticipated issue on departure for Bequia we lacked a picture card of a bear to test what is likely to be homophony between it and "beer" in speakers that the [ɹ] interaction occurs in.

The conclusion from analyzing the available tokens is that the precise nature of rhoticity in BeqC is unclear at present. While there is evidence for BeqC being non-rhotic – not every speaker on the island uses [ɛ:] instead of [ɹ] as shown in **figure 4.61** and **4.62** ("*beer*")**,** which compares two different speakers (one from Mount Pleasant demonstrating an [ɹ] word finally and the other from Hamilton demonstrating what sounds like "bear" with no [ɹ] word finally). As you can see, the speaker from Mount Pleasant has a sharp drop in the third formant indicative of an [ɹ] whilst the Hamilton speaker does not in addition to the word sounding very much like "*bear*", suggesting the use of a non-rhotic accent there.

There are several questions remaining to be addressed as a result of this – first and foremost of which is whether or not BeqC as a whole is rhotic or not. It is possible that certain speakers are using a rhotic accent whilst others are not or only sometimes use a rhotic accent and favour non-rhoticity. However there is no direct evidence of such optional rhoticity in speakers who use [ɛ:], making "*beer*" into a homophonous pair with "*bear*" at present although further analysis of suitable tokens would answer this question.

The second most important question is whether or not there is variation between speaker groups regarding the status of rhoticity. After a thorough re-examination of our data, evidence seems to suggest that speakers from Mount Pleasant are more prone to speaking in a rhotic accent whilst speakers from Hamilton and Paget Farm

are not at least when using the word "*beer*". Whether this is truly representative of if the speakers in Mount Pleasant have a rhotic or not though or not is not certain as many speakers from the area have been exposed to rhotic dialects either due to family who have lived abroad or from working with foreigners in a business capacity. A larger sample of minimal pairs designed to elicit [ɹ] in rhotic accents from speakers of the three areas would help to illustrate whether or not variation was occurring between them. If proved to be the case that Mount Pleasant speakers use a rhotic accent while the other two main areas do not though this would help explain in part why residents of Bequia label speakers from Mount Pleasant as speaking "more properly" than speakers from Hamilton or Paget Farm.

As we will discuss in our discussion section though – our study is geared towards providing a descriptive framework of BeqC's phonemic inventory as opposed to establishing what makes each area different. Therefore anything we point out here is purely in relation to the phonological differences observed. If we had wanted to examine the variation in greater detail then folk linguistic interviews would have been conducted asking speakers what they felt differentiated speakers from each area as it is also possible any phonological differences observed are not considered by members of each area as being noticeable.

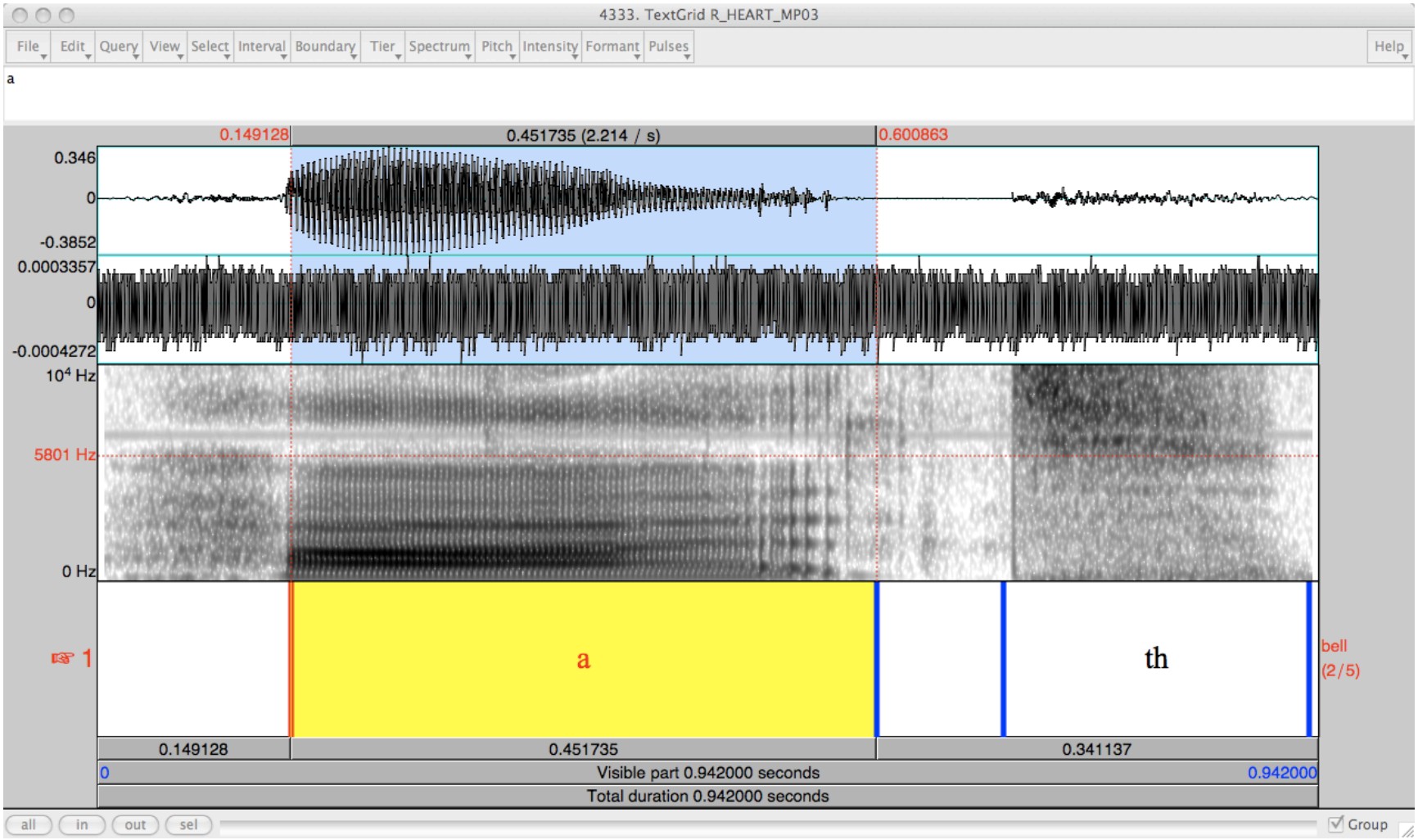


Figure 4.60 - *An example of the lack of rhoticity in BeqC with the word "heart"*

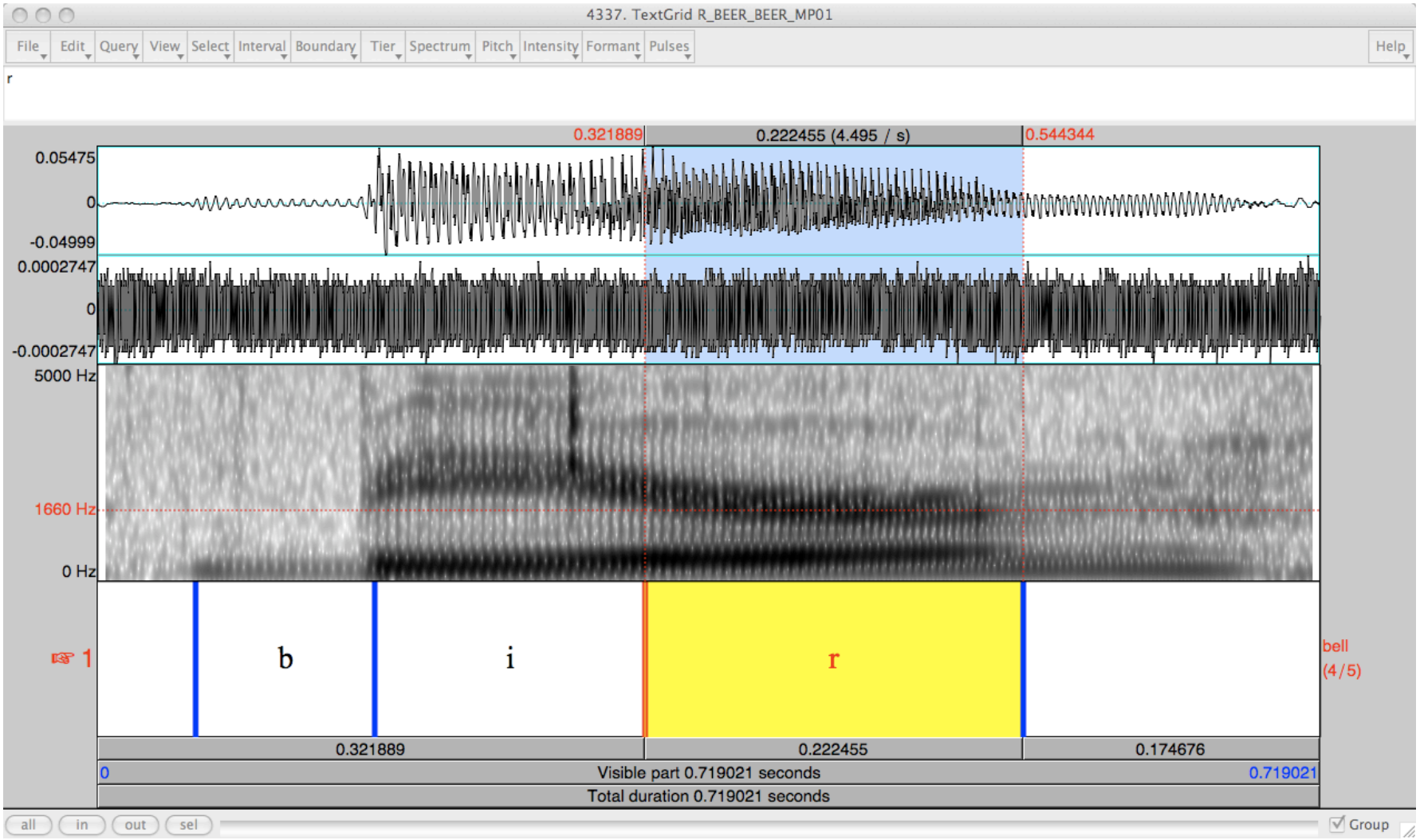


Figure 4.61 - *An example of rhoticity in BeqC with the word "beer"*

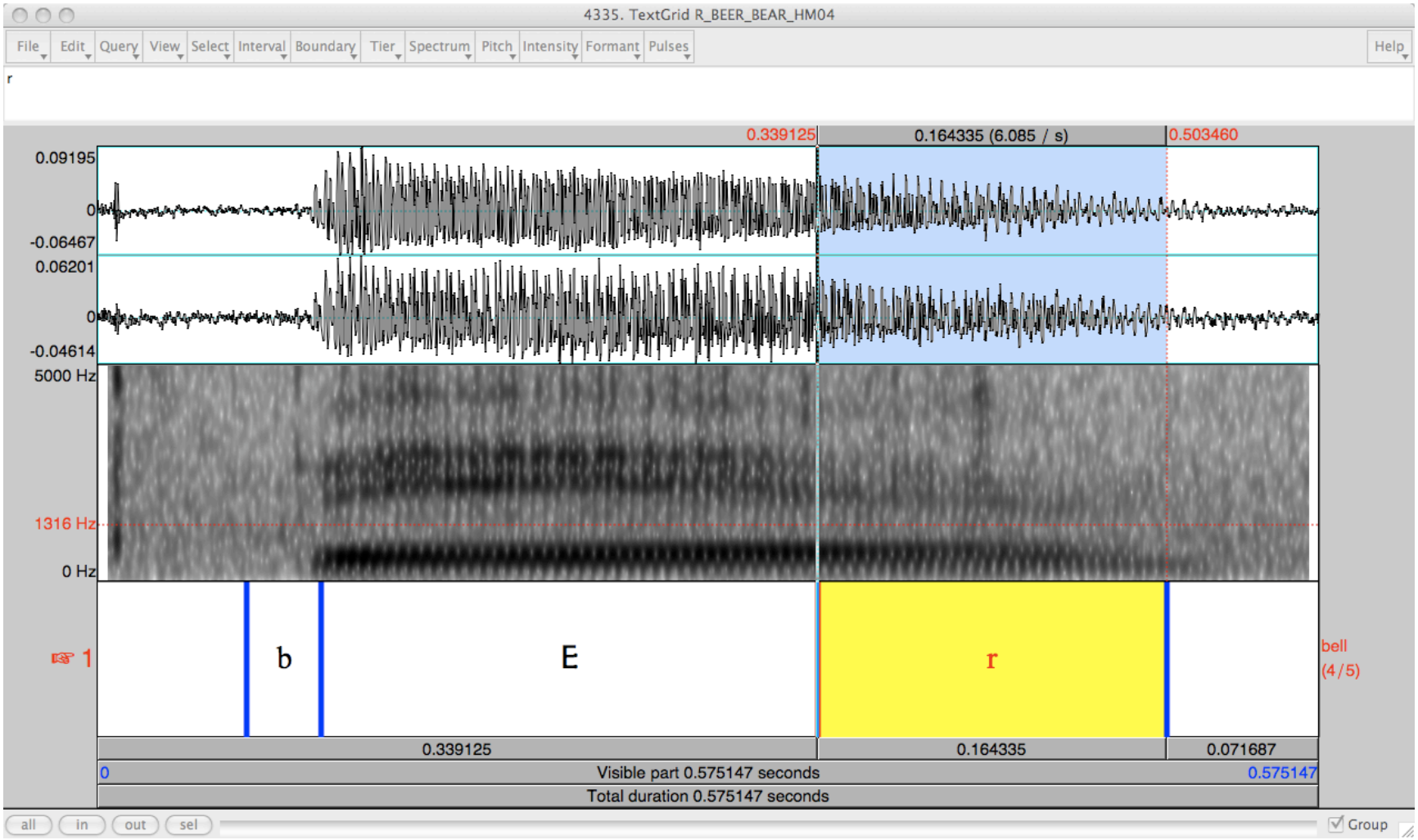


Figure 4.62 - *An example of the lack of rhoticity in BeqC with the word "beer"*

Hyper-articulation word finally, showing plosives word finally.

Related to the subject of speakers of BeqC, like many variants of English, not fully releasing word final stops – during the experiment we observed hyper-articulation occurring word finally that is worth a brief footnote. As we discussed before, speakers of BeqC clearly do realize stops word finally in their representations of words like "list", "cat", "bat" and "fist" but evidence of these are normally obscured due to the vocal folds closing upon articulation of the vowels.

Figure 4.63 ("*coat*"), as well as many of the examples given throughout this section, demonstrates examples of word final stops that are aspirated and articulated a short period of time after the vowel segment has ended. The aspiration occurs to overemphasize the fact to the interviewer as a foreign listener that they do have the relevant plosive word finally despite the fact that often as we have demonstrated that it is hard to see the plosive being realized in BeqC. This supports our statement that plosives are not neutralized/deleted word finally by speakers on Bequia, as if they were deleted or neutralized speakers would not be hyper-articulating them word finally unless they thought they should be there supporting the observation that the word-final consonants are just not fully released. As each word is spoken in isolation, speakers want to be sure that each word is audible to the interviewer as well – so they hyper-articulate the final phoneme in each word.

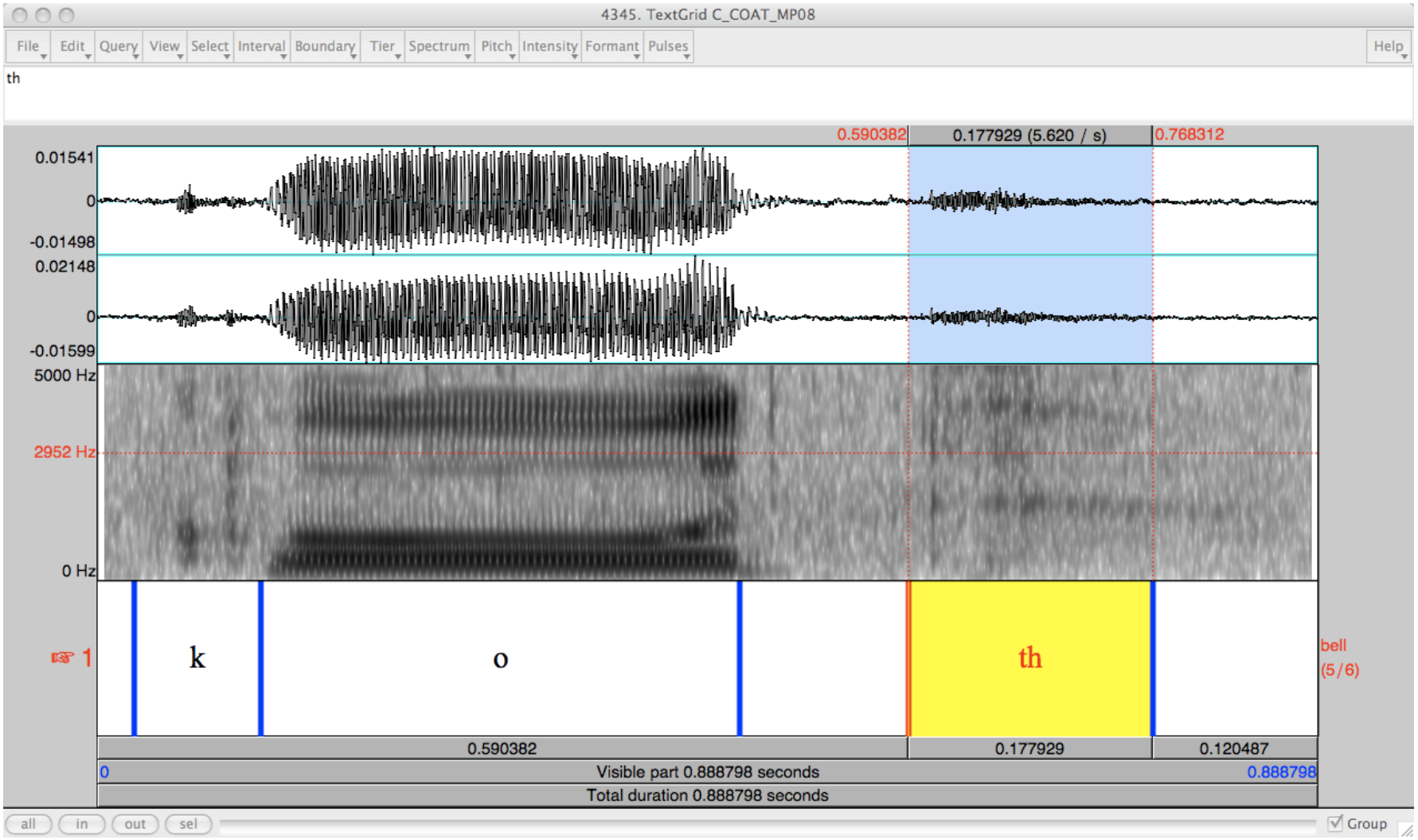


Figure 4.63 - *An example of hyperarticulation in BeqC.*

4.5 Making judgments about phonetic realizations using words in isolation

While our data above has allowed us to detail with a reasonable degree of precision the vowel space and phonemic inventory on the island of Bequia – it is important to note before progressing to the discussion phase of this dissertation an important element that is missing: data over a greater phrasal domain. Our corpus sample was extremely small (2 per area) and we had to cancel the examination of such a domain from the data collection phase. While it would be possible to look at the this greater phrasal domain using corpus data this would have required more time after the analysis of Bequia's phonemic inventory and vowel space to find an extra two speakers per area and a sufficient number of comparable examples across speakers per area to analyze. As time was not available afterwards to gather the extra data from the Bequia corpus, we made use of observations made both before arriving on Bequia with the hypothesis data set combined with evidence for certain phenomena occurring in isolated speech. While we have been able to provide a solid descriptive analysis of the vowel space and phonemic inventory, a more thorough analysis of speech over a greater phrasal domain is needed to ensure nothing has been ignored as a result of the primary focus being on words in isolation.

The issue described above has impacted our ability to address other questions in BeqC but not too significantly, which we will elaborate on briefly during section **5.4.**

5.0 Discussion

After laying out both the vowel spaces and general phonemic inventory for speakers of BeqC, there are several key questions to discuss. Among these questions are whether or not there is variation between speaker groups in BeqC phonologically, as well as comparing the vowel space of Bequia to its closest neighbor in the Caribbean, Saint Vincent, and beyond. By at least touching on questions like these it is hoped that this will help put the descriptive work done in this dissertation on BeqC into the broader context set up by works such as Wells (1982) who have already carried out descriptive phonological work in the Caribbean. There are also several methodological issues worth discussing in this section, both with regards to the data collection performed in Bequia (such as changes that had to be made to the structure of the experiment whilst out in Bequia) as well as in a more general sense.

It should also be noted before discussing the main questions regarding the vowel space of Bequia that by collecting data from the island for this dissertation we have been presented with a unique opportunity. With the corpus data already assembled by Meyerhoff, Walker and Sindell (2005), we will look at how the sociolinguistic data collected for the Bequia corpus compares to our data gathered for phonetic purposes in more detail during **section 5.3.**

5.1 Phonetic variation between speaker groups in BeqC?

During our analysis of the vowel data from Bequia we concluded that there was little to no variation occurring between speaker groups on Bequia. Based on the available sample of speakers, this implied that residents of the island do not identify each other based on vowel spaces. However there are several possibilities we have not covered so far that fall within our data's remit relating to prosody.

Having discussed the subject of different regions of Bequia speaking "differently" from RP English with many on the island, two points were frequently mentioned by residents. asked about differences were that BeqC speakers flowed one word into another quickly when speaking at ease to one another and were said to be "dragging their words". Whether speakers were referring to neutralization, deletion or another unrelated phenomena is unclear based on the understandably limited ability speakers had to describe their linguistic system. When we evaluated what speakers were saying

was used to differentiate speaking style, one particular variable - however unlikely to be the case: vowel duration. If speakers create what sounds like one steady stream of linked words, then one very remote possibility is that the way they may tell each other apart is how long they articulate monothongs and/or diphthongs for. Due to the sheer number of variables that may impact on the duration of vowels in general across speakers this is highly unlikely.

If any durational study of monothongs and diphthongs is likely to yield signs of variation between speakers it would be in the short and long vowels as discussed in **4.2**. As speakers lengthen certain vowels to make distinctions between words, as we discussed before with examples like "*born*"/"*ban*" and "*hear*"/"*here*", it is conceivable that speakers from different areas lengthen the vowels to a different extent to differentiate one another from different areas. It is not our belief that this is the case based on the current evidence for lengthening, however, it is still a possibility and even if it was not the case, a study of the durational ratios between the regular monothong and its alleged lengthened counterpart would be valuable at least to prove a lack of a salient difference between the two words. Such an examination for BeqC was not possible due to a sufficient amount of tokens (ideally a minimum of 8 short and 8 long tokens collected over 3 repetitions from each speaker) in the collected data, however is something that would be worthwhile doing in future to add further detail to the description of BeqC.

Among the other potential prosodic factors that may vary depending on area that we were unable to investigate given time constraints when in Bequia, word stress is one of the most probable other areas where different groups on the island may vary. To give an example, speakers from one area may stress certain words in an initial position while others may place stress word finally – however testing to find tokens that would demonstrate this would involve a lot more time interacting with residents of the island than the three weeks that were available to us.

Another case raised by Wells (1982) is that in Barbados, one of the closest islands to Bequia there are minimal pairs constructed using stress. Examples of this cited by Wells include " '*brother*" (a family relation) and "^*brother*" (member of a religious group) and it would be worth examining such stress patterns to see if such a phenomenon occurs in Bequia and if so what distribution it has. Testing for this

possibility is far less time consuming and easier than the other potential stress variation between areas, as the basic minimal pairs where it occurs elsewhere have already been laid out giving a good foundation to begin with. Regardless of whether this demonstrates variation between the areas of BeqC or not, pursuing stress patterns in future would help to further understand how widespread the phenomenon noted by Wells is and if it is a feature of speakers in Saint Vincent and the Grenadines.

Ultimately, one of the areas that require a far more detailed examination regarding any potential phonological variation is how phonemes behave over a greater phrasal domain. We have so far demonstrated that the vowel space of BeqC shows some potential signs of variation pending examination of a larger sample. Even if signs of variation proved conclusive, without a more in depth examination of either good quality corpus recordings or interviews from speakers collected with better audio equipment we cannot say for certain we have identified all the realizational phenomena in BeqC. Therefore we cannot say for certain that there are not realizational differences between Mount Pleasant, Hamilton and Paget Farm.

While what has been observed from the phonemic data so far suggests there is a need for a greater sample to conclude if variation is occurring on a phonological level between villages on the island it is important to note the dilemma faced by sociolinguists upon visiting the island of Bequia. For example every resident of the island insists that there is a clear difference between speakers from Paget Farm, using their limited meta-linguistic vocabulary to describe them as dragging their words, whereas the description of people from Mount Pleasant is far vaguer and is summarized often as merely speaking more "properly" than residents from Hamilton or Paget Farm. Further examination over a greater phrasal domain would also help us understand what happens in unstressed, disyllabic and polysyllabic words. For example are vowels in such words reduced, as you would expect in British or American English or are they still full words?

Meyerhoff and Walker (2006) also noted that when examining location as a variable in their Goldvarb (Sankoff et al. 2005) analysis of the presence of the morphosyntactic variable *BE,* region did not play a part in distinguishing speakers. Therefore it is especially important that we examine phonemes over a greater phrasal

domain in BeqC are examined in order to either rule out or provide stronger evidence if the phonology of BeqC plays a part in the variation occurring in BeqC.

Underlying our entire point on variation is that beyond a purely phonological look when describing the three areas of Bequia, our study is not designed to elicit precise answers as to why the speakers believe there to be variation between areas. For example one other potential reason for the belief in variation could include the difference in preference by speakers for using either British English or American English as the standard. As the recorded data also shows there is a distinct difference between how certain people pronounce "vase" on the island – some speakers choose to use the American pronunciation whilst others choose the British English version. This is a potential difference that a study designed to elicit both folk linguistic opinions as well as potential tokens would specifically show and is why such a study is far more ideal now that we have established the basic vowel space and phonemic inventory.

5.2 Similarities between BeqC, VinC and beyond

Up until now we have treated BeqC as an Anglophone Caribbean creole that we initially knew nothing about phonologically. However there are several works from Saint Vincent that are relevant to the examination of BeqC which are worth looking at now to compare our findings to. First and foremost worth discussing is the work of Prescod (2004), who we mentioned during the introduction when considering the pre-existing literature about the region. Firstly – although only one subject was used from an unspecified area on the island, a basic acoustic analysis was performed of the vowel space of VinC. This gave what was an extremely rough idea of the vowel space of the island, although by Prescod's own admission the whole chapter was not meant to be a formal proposal of the phonology of VinC. Instead it was meant to be just a rough outline to give a basic orthography for use in their PhD thesis. Regardless of the sample size – Prescod's preliminary findings for the vowel space of Saint Vincent revealed that there are a number of similarities between the vowel space and realizational issues presented by Prescod and those we presented in the results section of this dissertation. Given the original vowel plot in Prescod was not plotted

using a program like Plotnik[4] or in our case JPlotFormants[5], we took the results given by Prescod and redrew the chart using JPlotFormants to give us the version in ***Figure 5.1*** of the sample of VinC using one female speaker that is comparable to the vowel charts drawn for our 12 person sample of BeqC.

One of the most striking similarities in terms of relative position of the vowel space given by Prescod and those shown in section **4.2** of BeqC is the relative position of [a] and [ɑ]. As ***Figure 5.1*** shows, there is one central low vowel whilst the [ɑ] can be seen as occurring still relatively centrally but in a much higher position. This matches what was found in BeqC in general as we found the same relative positions of the two central low vowels – with [a] much lower than [ɑ] was. This is in line with what would be expected between the two islands given their proximity you would expect a great deal of similarity between relative positions especially given the amount of inter-marrying that goes on between island.

Perhaps of more interest related to comparing the vowel space of VinC to those plotted for BeqC though is the difference in relative positions of the back vowels. In VinC [u] is further back than [o] whereas in BeqC it is the other way round across all three areas of Bequia. The simple explanation for this is that if you were to take a larger sample of speakers from VinC you would find a similar result to that of Bequia. As any number of speech processes could be at work, causing the positions of the two backmost vowels to be reversed in the 1-person sample of VinC such as vocal tract length for example. Without a larger sample of tokens containing the back vowels in VinC from a larger number of speakers than used in Prescod it is impossible to tell whether or not there is a difference in relative position of the back vowels in VinC when compared to BeqC.

[4] http://www.ling.upenn.edu/~wlabov/Plotnik.html
[5] http://www.linguistics.ucla.edu/people/grads/billerey/PlotFrog.htm

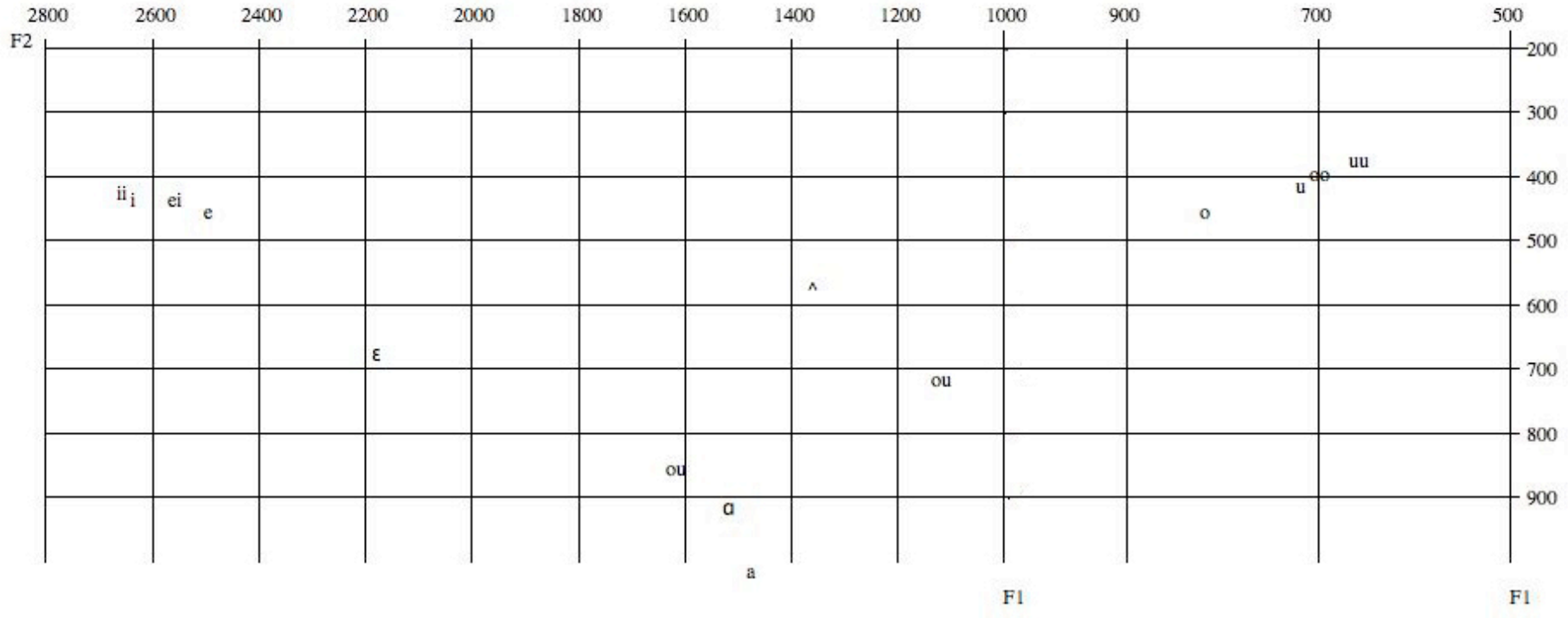


Figure 5.1 - ***The vowel space of VinC replotted using JPlotFormants spread over 2 figures.***

Although the above provides an indication of how related the phonemic inventories are between the two areas, overall the data on VinC was not meant to lie out the exact vowel space of VinC. As a result of this Prescod does not state how many tokens or what words specifically she uses, only that she recorded examples of each vowel she stated as existing in VinC and as a resident of Saint Vincent originally her observations carry some weight. If any real comparison between VinC and BeqC's vowel spaces is to be made then what is needed is a full vowel space analysis using a reasonable number of speakers to form a representative sample of the island's population. What is perhaps more relevant to discuss here and helps put what we have learnt about BeqC into perspective as a result are the observations made about realizational phenomena used by Vincentians.

Although there were certain similarities between phonetic realizations and observed phenomenon in BeqC, there are a number of clear differences. For example Prescod discusses a class of monothong vowel in VinC she describes as a "double length" vowel, used to differentiate between words that would otherwise be minimal pairs in the area. In VinC there are several words that, due to a lack of certain vowels compared to standard dialects of English, would sound homophonous without some way to differentiate between them. Prescod describes these vowels as being double the length of regular monothongs and presents three key lengthened vowels "aa" (as in "*born*"), "oo" (as in "*bore*") and "ii" (as in "*bean*"). According to the passage in Prescod (2004), speakers when faced with words that would sound identical in VinC such as "*ban*" and "*barn*" or "*here*" and "*hear*" actually are differentiated by speakers by lengthening one of the vowels so they become [ban]/[baan] and [hiɹ]/[hiiɹ]. It is worth noting in relation to whether these "double length" monothongs are just an allophone of their single-length counterparts or a separate phoneme that Prescod plots their formants separately to their counterparts – although not explicitly stating an assumption either way with regards to the phenomenon we can infer from this that they were considered as such. Based on the formants for each lengthened vowel for a single speaker it is impossible to tell whether or not the differences in formant frequencies are indicative of a different phoneme but this could be tested for in future if a larger phonetic corpus of data was collected from Saint Vincent.

Based on the example given of the "aa" difference ("*ban*" and "*born*") we designed a part of our data collection exercise to examine this in greater detail using "*hat*" and "*heart*" that we believed in BeqC would be using the same vowel as described during the results section of this dissertation. The fact that our findings suggested that the hat/heart pair are using different vowels for each to differentiate them does not prove that lengthened monothongs are not present in BeqC. However, further investigation of this phenomenon is impossible without searching the corpus in greater depth for new tokens. We did investigate what seemed to be a similar phenomenon with "*ban/born*" in the corpus data but we did not find sufficient evidence to determine durational differences. To better understand if speakers have a salient difference in length between certain monothongs to differentiate between words then all that needs to be done is locate minimal pairs. These minimal pairs include the ones listed above across speakers and both examine the formants to ensure the same vowel is being used and then examine the durational differences between them. This will help us understand whether the "double" part of Prescod's label for them is accurate and if it applies to BeqC as well.

Another feature of BeqC that Prescod also notes as occurring in VinC is the interaction with consonant clusters and [ɹ]. The[ɹ] phoneme is noted as causing changes in word initial clusters in VinC similar to the ones we noted, including examples as given in BeqC - namely "tree" and "drink" becoming [tʃ] [dʒ]. Although Prescod cites each example without evidence in the form of waveforms or spectrograms showing the phonemes word initially. What both BeqC's evidence and VinC by proxy, assuming their statement of similar occurring to be correct, substantiate is what Wells (1982) highlighted as a merger occurring between [tɹ] and [dɹ] with the affricate versions we discussed above. Although Wells highlights this merger as only occurring in Jamaica to his knowledge, he leaves the possibility it may occur further across the Caribbean open. If this is the same merger then it is occurring across regions of the Caribbean, it raises the question – just how far does it extend if it reaches from Jamaica to Bequia? Evidence from other islands in the Caribbean is at present unavailable beyond the observations made by Wells (1982) in the third volume of "The Accents of English" however if it occurs across both sides of the Caribbean it stands to reason that islands in between should be examined too in

order to see if this merger is something that is a common phonological feature across anglophone creoles or not. For now though, we can conclude that it is certainly a part of BeqC, although to what extent it is present is not fully clear yet. While this phenomena occurs with a relatively high degree of frequency for words beginning [tɹ] there was only a very small sample of speakers doing the same for the voiced affricate. This difference in distribution is most likely just due to the sample of speakers being relatively small though and a larger sample of approximately double the number used by this dissertation may show the merger between the voiced stop and voiced affricate when followed by a [ɹ] to be more common in BeqC than our data suggested.

What is interesting about the status of [ɹ] is that while we noted the merger occurs in VinC as well as BeqC, unlike VinC we also observed this occurring word finally in "beer" particularly, suggesting a lack of rhoticity in BeqC. This may be due to the particular words selected for the data collection phase but what we observed has the potential to differ from what is defined as "usual" by Wells (1982: 570). Wells observes it is common in both rhotic and non-rhotic accents for "*beer*" to become homophonous with the "*bare*"-"*bear*". In BeqC we have observed two different versions of "*beer*" being articulated at present though. One version sounds like most dialects of British in the UK would consider "*bear*" to sound like, while the other sounds like we would say "*beer*". We compare to speakers of British English as this is the variety taught in schools to children, however as we have noted during our final thoughts on variation between areas, there is a mixture of preference for American versus British English on Bequia based on their geographical proximity to America versus Britain. In American English the rhotic accent is perceived as standard so this may in turn help to explain the reason that speakers view Mount Pleasant as the prestige "area" of the island, however this is purely circumstantial without a more in-depth survey of language attitudes on Bequia.

Worth considering about this is that a comparison between word pairs such as "*beer*"/"*bear*" where you would expect homophony to occur has not been done yet. If there was a rhotic area of Bequia you would expect words with a non rhotic accent in VinC to differ from the ones in the rhotic area of Bequia. If VinC is non-rhotic then

you would expect a similar patterning acoustically to that of the clearly non-rhotic areas in BeqC.

A final similarity observed between BeqC and VinC relates to consonant clusters word initially – this time related to velars. We observed word initial velars [k] and [g] followed by open front vowels tend to be palatalized by speakers across Bequia. For example "*cat*" is pronounced as [kjat] in BeqC as opposed to [kat] and we also observed that while creating networks on the island for interviewing that the same effect was heard for "girl" which is pronounced as [gjal]. Prescod (2004) also notes the same palatalisation in VinC although she also notes that the process includes the velar nasal [ŋ] as well – which due to the lack of examples like "news" in our data set we are unable to substantiate or disprove as occurring in BeqC. Based on Prescod's findings regarding palatalisation our findings seem to be consistent with the same process occurring in Bequia – so despite a lack of available tokens to prove this we can assume that it occurs with the nasal velar before open vowels as well.

While the second chapter of Prescod (2004) is an informative read and reveals several interesting potential comparisons based on the purpose it was designed for it raises more questions than it answers. For example, among the questions are what Prescod labels as double-length vowels – are these really double length, as durational tests were not performed, and do these occur more commonly than in BeqC? These are all questions worth pursuing if elaborating in greater depth the vowel spaces of further islands in the Leeward Islands of the Caribbean. If rhoticity was occurring on any part of Bequia this would be cause for further study of the variable, as we touched on briefly before, VinC is said to be a non rhotic creole both by Prescod (2004) as well as by Le Page (1972), who is referred to in Holm (1989: 458) as saying that the attested rhotic consonant in Bajan is not attested in VinC.

Among the other points Holms summarizes about VinC is the claim that no distinction is made between the diphthongs [ɔi] and [ai] in VinC. This fact is supported by Prescod who summarizes the above as one of the main points Holms (1989: 358) makes about VinC then goes on to agree that there is no such distinction in the creole. As our results section discusses though, we found a diphthong either using [ɔi] or [ɔi] to be present as a part of all speaker groups on the islands phonemic inventory**.** ***Figures 4.15-17*** show the formant trajectory - based upon 4 speakers

from each area - for the diphthong in question for [ɔi] and the token list used to illicit these vowels can be found in **appendix 2**. Examining the trajectory of [ai] next to this diphthong it becomes immediately apparent that while the relative position of the mid-point and end point of the two diphthongs are the same, the relative position of each diphthongs initial point is different. If speakers of BeqC made no distinction between words such as "Kyle" and "coil" for example then you would expect the relative position of the initial point of each diphthong to be very similar if not basically identical.

This is not the only difference relating to diphthongs observed between VinC and BeqC too – in VinC it is proposed that there is a diphthong [eI] for words such as "face" for example. Our findings in Bequia suggest that speakers do not use a diphthong for words such as "face" but instead, as discussed at the end of our analysis of monothongs, actually just use [e] with a slight upglide. This is demonstrated in ***figure 4.36*** *("face")* and while there is a clear transition from the starting point of the vowel in to the midpoint, it remains stable after that. Sometimes with certain speakers the upglide is far less visible than with others, so our example shows it at its most visible, which prompted us to look across speakers to ensure it was not a diphthong. This finding would suggest that BeqC has the same number of differentiations between diphthongs that VinC has – except one out of the three diphthongs they use is different.

Also worth mentioning briefly when comparing BeqC to other regions in the Caribbean are the findings of Wells (1982), particularly with regards to the accuracy of his generalized comments about features of anglophone creoles in the Caribbean. Firstly as can be seen throughout the discussion section we have highlighted several points made that have proved to be accurate or at least seem to correlate with his comments – such as the status of words such as "*beer"* being homophonous with "*bear*"/"*bare*" as well as other phenomena such as the merger observed in Jamaica with [tr] and [dr] and the respective affricates for example. Despite by his own admission having to rely on the findings of others or what he had heard by ear without acoustic analysis, the majority of his observations that are relevant to the Leeward islands prove to be accurate when found in BeqC. What is impressive about his analysis of the Leeward Islands though is the lack of any commentary about the

phonology of Saint Vincent while there is an examination of both Barbados and Montserrat, the closest two islands to St Vincent and the Grenadines from a phonological perspective. This may be because at the time of Wells' three part series on the dialects of English, that Saint Vincent had only just been freed from British rule and therefore was only starting to become aware of the importance of its own dialect at this point.

In summary, having examined the works that touch on the phonology of VinC in relation to what we have found during our analysis of BeqC, the results for the most part fitted with the null hypothesis that given the close proximity to one another, there would be similarities between the two creoles. However, despite the similarities found, our findings from our analysis of collected data and the Bequia corpus have raised several differences between the two creoles as well as questions about both the phonology of BeqC and VinC that can only be addressed by a relevant phonological study of Saint Vincent.

5.3 Collected data compared to the Bequia Corpus data

During our analysis of the data collected it was impossible not to look back at the Bequia corpus data and to look for differences both in terms of audio quality as well as differences in terms of realizations. Firstly, data collected out in Bequia for this MSc dissertation was on the whole of a better quality for audio analysis than the data of the Bequia corpus. While the evidence we selected from the corpus, from 2 speakers per area, was of readable quality – there are several examples of bad quality recordings due to background noise in the undergrduate dissertation by Partridge (2008).

It would be a gross misrepresentation to say that all of the data in the Bequia corpus is bad quality as we have covered in part already. There were several series of speakers collected, mostly from Mount Pleasant, where the interviews appear to have been taken indoors mostly that have very good audio quality. The main problem behind the audio quality problems was due to the scale of the data needing collected and the difficulties that would be faced by the project leads collecting the data, residents of the island were hired to act as interviewers over the island. This move undoubtedly appealed to a broader, more diverse, range of speakers across age groups on the island. It also avoided any potential awkwardness that could have been caused by

someone who stands out as clearly being foreign conducting the interview. This fits with the goal of the Bequia corpus, which was to gather sociolinguistic data primarily useable for purposes outside of sociophonetics. Consequently the extra data gathered was needed to provide an accurate picture representative of all the key areas of Bequia's phonemic inventory.

One of the greater problems from an acoustic analysis standpoint with the Bequia corpus was the lack of a word list to give speakers before conducting the interview. While this was not entirely necessary for the planned purposes of the data, it would have given sociophoneticians a chance to make use of the data a lot more than was possible originally as well as give an opportunity to hear speakers of BeqC use a different register than the conversational one used for most of the interviews conducted. To a lesser extent the data collected during this dissertation has remedied this problem, however there is a question of whether or not residents of Bequia were speaking slower or not using showing different realizations due to the lack of speech over a greater phrasal domain. Even outside of recording time with the interviewer as a large number of the participants in the data collection exercise were used to dealing with tourists or foreigners in general making gathering accurate data as a foreigner difficult. As a result, the Bequia corpus is still invaluable at present for identifying potential features of speech to follow up with more data collection on Bequia as well as for identifying a number of key syntactic and morphological issues.

From a phonological standpoint one of the most important differences between the data that was collected in Bequia compared to the corpus data is that the former are words for the most part in isolation while the Bequia corpus contains long tracts of speech data. Without both interviews over a greater phrasal domain and words in isolation it is impossible to be able to examine BeqC to its full potential. With words in isolation you are likely to find out the phonemic inventory and vowel space of the island, however it is far harder to tell if certain words are realized differently over a greater phrasal domain. due to any number of factors including but not limited to assimilations and mergers. Although most of the time in this dissertation was focused on analyzing the data collected while in Bequia, there are a lot of possibilities for future research using a combination of the Bequia corpus, picture card data from Bequia - most of whose participants marked down that they agreed to be used in future works - and the findings of this dissertation. To finalize the description of

Bequia's phonetic realizations, a mix of the longer tracts of interview and collected picture card data is crucial.

5.4 Methodology – troubles faced and potential solutions

Visiting Bequia helped us understand and revise several of our points formed while analyzing the hypothesis data. One of the main things we had to revise was the misguided impression that residents of Bequia were potentially an isolated community up until recent years. While we marked this as only a possibility as opposed to something we intended to follow up in a great deal of detail, whilst on Bequia it became very clear this was not the case. Not only is Bequia one of the Caribbean's favourite hotspots for holiday connoisseurs but there are also a lot of people who travel from other areas of the Caribbean to work in Bequia. As a result we must disregard any thoughts that residents of Bequia are linguistically isolated from other varieties of English and any potential references to isolation such as identifying speakers from Bequia versus "overseas people" as one resident said in an interview from the Bequia corpus.

Time spent in Bequia proved to be both invaluable and eye-opening when writing this dissertation for any number of reasons, however there were also problems with the data collection exercises devised as a result, that were not obvious until arrival in Bequia. First of these was the fact that despite there being a compulsory age that children must remain at school in Saint Vincent and the Grenadines, the general literacy rate of the island is very low. One risk that became immediately apparent was that if we presented the word cards during the elicitation sessions then speakers would be put off from taking part in the exercise. On an island as small as Bequia it became very obvious how quickly gossip spreads across the island as well – so if one or two speakers who did not like the elicitation tasks complained to their friends then this could have proved a problem. We received advice to the same effect from a returner to education from Mount Pleasant who was studying for an MSc related to children on the island who underlined the risk that other less educated speakers on Bequia may be put off by the word cards. Consequently we revised our experimental procedure whilst on the island to not include word cards as part of the main elicitation task. Instead of this we would ask speakers after if they minded doing word cards but stressed that such a task was completely optional. Fewer than five speakers agreed to

use the word cards across the whole of the 18 female speaker sample of Bequia who took part (although two men from Hamilton who also tried the elicitation tasks also agreed to use the word cards). The result as discussed during our results section such as for TH-stopping as well as other phenomena and a potential other vowel. In future it would be possible to remedy this by carrying an additional set of picture cards that would capture any extra sounds that could be added last minute into the picture card deck to replace word cards.

It was also agreed that video recordings of participants would not be possible during data collection. Before collecting data due to arriving over Easer[6] we had time to network initially and gather opinions from residents of the island. Everyone we talked to unanimously agreed they would not take part if video recording was involved despite any assurances that their identity would be kept hidden and never shown to the public. Overall this did not impact on the description of the phonemic inventory and realizations of BeqC, although it did hinder certain questions regarding place of articulation for a few consonants as we marked in the results section.

Overall after cutting out the picture card element from the data collection exercise though the elicitation task was well received by residents on the island. In several cases participants would either call friends to get them to take part or ask their relations to take part - because they enjoyed it as opposed to being asked to do so. There were several small problems with the picture card elicitation task that are also worth discussing briefly. Firstly, while we gathered the tokens needed one of the problems with using picture cards, as considered during the initial conception phase of the elicitation task was that the task, is a semi-structured. The downside to a semi-structured task is that you cannot guarantee what each response from the speaker is going to be. This is better than uncontrollable data as it guides the participant into giving answers that are close to the desired one often but there is a risk of getting a different vowel if the speaker thinks that a sad face looks like a person crying for example. The only way to make this clearer in general would be to spend time either actually in the area you are collecting data or speaking remotely with a consultant

[6] On Bequia, Easter is regarded as a holiday bigger than Christmas. This meant that for the first 4-5 days on island that nobody was available to be interviewed so we used it to arrange interviews and network instead.

before creating the cards to agree on pictures that participants would recognize as the desired token. Due to time and financial constraints on this dissertation this was not possible during our work. Such efforts if done would help avoid potential embarrassment as was experienced by the experimenter who managed to use a picture to represent "barn" that looked almost identical to how the Seventh Day Adventist church on the island looked. Thankfully this similarity proved to be a point that broke the ice with several Seventh Day Adventists, however it could have just as easily caused offense to them.

The only other issue that arose on the island methodologically was that, being a semi-structured task, despite the interviewer explaining the task clearly and the speakers showing understanding occasionally they would deviate from the standard procedure as laid out during the methodology. In these circumstances speakers tended to keep guessing until they got what a picture was correct, ignoring the word on the back of the card, or skipping straight to the word on the back to speed the whole process up for one reason or another. Where possible, any speakers who deviated from the normal method were excluded from the speaker sample used across Bequia's three main areas.

5.5 In relation to Thomas and Bailey's (1991) findings when comparing between AAVE and Carribean Creoles

As a side point it is worth addressing how our data helps, if at all, with furthering future work on the subject began by Thomas and Bailey's (1991) into the similarities and potentially shared origins of Anglophone Caribbean creoles and African American Vernacular English. As discussed at the very beginning of this dissertation, one of Thomas and Bailey's conclusions was that there was a lack of acoustic analyses of Caribbean Creoles. Our descriptive framework, despite being incomplete in certain places, should prove to be relevant in at least two key ways to similar studies in future.

Firstly, as a lot of the work comparing features of American white vernacular to African American vernacular involved the comparison of vowel spaces between speakers of the same historic period, our vowel space data will provide a useful reference point for part of the Leeward Islands. Given the size of Bequia compared to other Leeward Islands, our results are more likely to act as a cornerstone allowing

further studies of islands to be performed with some kind of basic idea of the phonemic inventory that may be used. Ultimately, a more extensive look at the vowel space of islands across the Caribbean would be needed to make use of the BeqC vowel data in a study comparing relevant Caribbean creoles to AAVE as what is needed to perform such an analysis is an understanding of the variation between vowel spaces that occurs across the Caribbean, not just in one part of the Leeward islands.

The second key area that would be of use to future studies such as the one discussed above relates to our comments on phonetic realizations of parts of the inventory of BeqC. Although as we discussed a complete picture of the realizational phenomenon was not possible during this dissertation, we did manage to indicate a number of important areas of note, some of which were similar to observed occurrences in VinC as well. Ideally further work should be done to develop a stronger description of VinC and BeqC's phonetic realization features over larger tracts of speech as well as some more depth on where some of the features originated from if historic evidence is available on the island, even if just a rough background from more elderly residents of the island with folk linguistic information. With such data both present and historical we would be able to look at both potential elements of AAVE that came from Anglophone Caribbean creoles as well as how the two have diverged or stayed the same in some general aspects over the years since then.

In conclusion, no matter how much the above points of our acoustic analysis or future studies related to it could prove useful or to help answer such questions as put forward by Thomas and Bailey, there are other issues in the way, as raised in their paper. For example, to examine the historical origins of the two, more data needs to be recorded and analyzed from the oldest available speakers for AAVE and this is marked as the most essential element just now alongside an analysis of vowel variation in Caribbean creoles, which until now is virtually non-existent for any one island let alone the Eastern and/or Western Caribbean as a whole**.** Obviously gathering recordings of the oldest possible speakers of AAVE is a more crucial concern for this question given the time-limited nature of acquiring the data whereas modern creole vowel variation can be performed at any time to supplement any further studies. As Thomas and Bailey (1991) conclude there are a number of elements, apart from a better understanding of the phonemic inventories and realizations of Caribbean creoles

required to further examine the question of similarities and differences between the variation of AAVE and Caribbean creoles.

5.6 Future sociophonetic work using the data available on Bequia

While not directly related to the overall questions posed in this dissertation, it is worthwhile looking at what could be achieved in the future using this MSc dissertation and the data collected for it as a foundation. With the data analyzed so far we have laid out a basic descriptive framework that will allow sociophoneticians to investigate issues across Bequia and the islands in the Eastern Caribbean in general.

One of the most immediate questions that should be examined is how much BeqC varies phonologically to VinC. Nowadays it is very common to find that people are from Saint Vincent but have come across to Bequia to work either because they had contacts here that had a job available or they have married into a family on the island and moved across to Bequia as a result. Consequently, it would be worthwhile doing an examination of how much the younger generation use a mix of features found in BeqC and VinC. Related to this, a comparison of younger speaker's phonemic inventories against what we now know about the late teenage and adult phonemic inventories and realizations. If residents of Bequia and Saint Vincent keep inter-marrying then a later comparison between the two groups may reveal similarities not previously seen on the island, showing BeqC becoming even more similar to VinC than it currently is.

Before performing any comparison between any age group on Bequia to VinC though, we must first understand the phonemic inventory and realizations of VinC. To further this goal, one of the key studies that should be performed next should be a descriptive analysis of VinC. Such a study would help put the differences and similarities of not just Bequia but the other islands in Saint Vincent and the Grenadines into perspective too and could prove to be crucial in furthering our understanding of the phonology of the entire Leeward Islands.

Another use for the data collected would be to use the longer interviews available to perform a deeper analysis of what phonetic realizations are used by speakers in Bequia. Our efforts so far have revealed a reasonable amount of the realizational occurrences in BeqC but there are still questions waiting to be examined in greater

detail. For example we have already flagged occurrences where [ɹ] has altered vowels as highlighted in Wells (1982) such as "beer" becoming homophonous with "bear" – however we did not have enough available time at the end of the data analysis phase to examine what this meant for other vowels that have an [ɹ] word-finally. This, as discussed at the start of the discussion section, is one of the key areas worth investigating in greater depth at the first opportunity available.

Overall there are many phonological questions that are unanswered both about Bequia as well as the Leeward islands in general and this short piece only highlights a few of those questions.

6.0 Conclusion

The bulk of this dissertation focused on helping to fill the current almost complete lack of analysis of the vowel spaces of islands that speak anglophone Caribbean creoles as identified by Thomas and Bailey (1991) during their attempt to look at similarities between vowels in AAVE and anglophone Caribbean Creoles. To do this within the space and available funding for a Master of Science by Research dissertation we approached the Bequia Corpus with the goal of providing a descriptive framework of the phonemic inventory, vowel space and realizational features of BeqC. Having formed a number of hypotheses about the phonology of speakers from Bequia using the corpus we designed an elicitation task that would gather minimal or as near to minimal pairs as possible to allow a more in depth acoustic analysis of BeqC.

As a result of our data collection on Bequia we were able to provide the complete vowel space of BeqC as well as the phonemic inventory of speakers on the island, as summarized during our results section. Although there are a small number of points in the vowel space and consonant chart that we are unsure of, for the most part these were due to problems encountered whilst out on the island that necessitated abandoning a section of the elicitation task, as we examined during our discussion section. Regardless of this, thanks to the quality of audio equipment used to gather data combined with relatively quiet locations, we were able to gather good quality recordings that proved to be invaluable in PRAAT with minimal impact on our description of the vowel space as a result of changes made on island. Therefore we do not believe that the above problem impacted on our findings significantly.

Our secondary goal as a part of this dissertation was to follow up the reports from residents of Bequia that speakers from different areas of the island, split into three key areas in our study, speak differently from one another. Other features of BeqC such as morphosyntactic variables like *BE* have already been covered with a great deal more detail by Meyerhoff and Walker (2007), with the conclusion after statistical analysis that the villages do not influence how speakers use *BE* in BeqC. We decided to follow this up with an investigation of phonological factors and therefore we posed the question of what else could be causing variation between speakers of BeqC? As speakers describe each area as "sounding" different, given the lack of meta-linguistic

vocabulary for residents of the island, it is definitely worth considering variation that may be phonological as opposed to syntactic or morphological. Our strategy was to examine phonological factors that may that differentiate speakers by area including but not limited to considering if there were differences between relative positions of vowels in the vowel spaces of each area as well as prosodic factors such as any vowel durational differences between areas.

Although many points we covered throughout the results section yielded no evidence of variation between speakers, the issue of rhoticity on Bequia hinted at one potential source of the folk linguistic statements made that people from Mount Pleasant speak "more properly" than other speaker groups on the island. As covered in section ***4.4.3*** we observed that our sample of speakers from the Mount Pleasant area were using rhotics when speaking, whilst speakers from Paget Farm and Hamilton were using non-rhotic versions of words like "*beer*". While this is far from a conclusive finding, even though we went through the additional four speakers we had collected from Mount Pleasant – combined with our findings for vowels this does suggest further study into phonological variation is merited.

Despite there being potential phonological variation between Mount Pleasant and the other two areas, there are also no guarantees that what differentiates Paget Farm occurs on a phonological level, as there is no ability to differentiate between elements of speech when residents of Bequia describe the variation they believe is occuring. Consequently the variation could be occurring on any other level such as a syntactic or morphological one. Alternatively it could even be that such variation is only a folk linguistic belief – not something that there is any evidence for on any linguistic level. However, the final conclusion to this question is that without a study designed specifically to tackle language attitudes on Bequia, such a question is unanswered for now. Nonetheless this dissertation has helped contribute to our understanding of how this small island's three key areas may vary from one another both by raising one possible difference as well as highlighting a number of possible ways they could but do not vary. To approach the question of variation between areas a study designed to examine linguistic attitudes is required though. All this dissertation has done is highlight where phonological variation may be occurring, it does not mean that speakers from Bequia use anything highlighted to differentiate different areas.

As so little is known about the phonology of the Eastern Caribbean, this dissertation has raised a number of questions about similarities and variation between anglophone creoles spoken across the region. For example we have cited that a merger between [tr] and [dr] word initially has been observed in Bequia while it has also been cited as occurring on the other side of the Caribbean in Jamaica by Wells (1982). This prompts the question for further study of how far this merger spreads across the Caribbean and if any other phenomena do the same? Such questions are only answerable by performing similar work to what has been carried out in this dissertation across more islands in the Caribbean until we have a network of descriptions that span across the majority of islands in both the East and Western Caribbean. In addition to this – with a basic descriptive framework laid out for BeqC now – further study can be done on a plethora of other sociophonetic questions related to BeqC now. For example, now that we have a basic description of phonemes used in BeqC, sociophoneticians can look at the differences in speech between genders and across ages

To summarize, we have carried out what we set out to do and have provided a framework to be used for future research on the island. With only one or two small questions regarding the vowel and consonant inventory of Bequia left, there is now a descriptive framework available to sociophoneticians for further work both on Bequia as well as across the Eastern Caribbean. Although we were unable to provide a full description of the features over a larger phrasal domain in BeqC we have managed to highlight a sufficient number of features to allow a comparison between the creoles being used on Bequia and Saint Vincent and to complete the data analysis using data currently available from the Bequia corpus as well as data collected during this dissertation. While this dissertation has played its part in helping add description to the vowel space of Caribbean creoles, there is much work to be done in the field before anything can be said about the variation of vowel spaces in the Caribbean more generally.

Acknowledgements:

My supervisors – Alice Turk and Miriam Meyerhoff for putting up with a barrage of questions that ranged from the misguided to the difficult, without your supervision and encouragement I would not have made it beyond my undergraduate dissertation.

Agata Daleszynska – for helping me make the contacts I so desperately needed to make in such a short time out in Bequia.

The many people of Bequia who I can't name to protect their identities who humored the random stranger carrying a DAT recorder around and took part in my elicitation task, I now understand why so many people eventually return to Bequia!

Zoe Ng, Will Blewitt, Hugh Griffith and Christopher S. Deans for all the hel help proofreading this thesis.

My family (Ailsa, Mac, Eileen) and my girlfriend, Angie, for nodding, smiling and making sure I didn't die under a pile of papers or stress during the whole year.

Edinburgh University Small Research Grants fund – for helping make my research trip to Bequia tenable.

This study was made possible in part by the kind permission of The Bequia project to allow the use of its corpus. The Bequia sociolinguistics project, under the direction of Jack Sidnell, James A Walker and Miriam Meyerhoff, has been funded by agencies in North America and the United Kingdom. Assistance from the National Science Foundation (USA, BCS-0214216; Sidnell & Walker) and the Social Science and Humanities Research Council (Canada, SSHRC 410-2004-2193, Walker & Sidnell) and The British Academy (grants R37127, R37611) and the Carnegie Trust for the Universities of Scotland (Meyerhoff) have made this research possible.

Bibliography:

Aceto, M. (2003), "What are Creole languages?: An alternative approach to the anglophone Atlantic World with special emphasis on Barbudan Creole English", in M. Aceto & J.P. Williams (eds.), *Contact Englishes of the Eastern Caribbean*, as part of series *Varieties of English Around the World*, Amsterdam & Philadelphia: John Benjamins.

Aceto, M. (2004), "Eastern Caribbean English-derived language varieties: Phonology", in E. Schneider, K. Burridge, B. Kortmann, R. Mesthrie & C. Upton (eds.) *A Handbook of Varieties of English: Phonology (vol. 1)*, 481-500, Berlin & New York, NY: Mouton.

Bailey, G. and Thomas, E. (1998), "Some aspects of African-American Vernacular English phonology." In Mufwene S., Rickford J., Bailey G., & Baugh, J. (Eds.), *African American English: Structure, History, and Use*. London: Routledge, pp. 85-109.

Cukor-Avila, P. & Bailey, G. (2001), The effects of the race of the interviewer on sociolinguistic fieldwork, in *Journal of Sociolinguistics*, 5: 254-270.

Boersma, P. and Weenink, D., (2009), "Praat: doing phonetics by computer (Version 5.1.01)" [Computer program]

Edwards W.F., (2004), "Eastern Caribbean English-derived language varieties: Phonology", in E. Schneider, K. Burridge, B. Kortmann, R. Mesthrie & C. Upton (eds.) *A Handbook of Varieties of English: Phonology (vol. 1)*, 383-441, Berlin & New York, NY: Mouton.

Gooden, S. A, (2003), *The Phonology and Phonetics of Jamaican Creole Reduplication*. Phd Thesis. The Ohio State University.

Holm, J. (1989). *Pidgins and Creoles: Volume II*, 458, Cambridge University Press.

Kerswill, P.E. and Williams, A. (2000), "Creating a new town koine: children and language change in Milton Keynes" *Language in Society* 29: 65-115.

Ladefoged, P. (2005), *Vowels and Consonants 2nd ed.*, Oxford: Wliey Blackwell.

Ladefoged, P. (2003), *Phonetic Data Analysis: An Introduction to Fieldwork and Instrumental Techniques*, Malden, MA: Blackwell Publishing

Meade, R. 1996. "On the Phonology and Orthography of Jamaican Creole." in *the Journal of Pidgin and Creole Languages* 11, 335-41.

Meade, R, (2001), "Acquisition of Jamaican phonology: LOT" *dissertations 41*. Delft: De Systeem Drukkers.

Meyerhoff, M (2006), "The persistence of grammatical constraints: 'Urban sojourners' from Bequia." *PWPL: Selected papers from NWAV 34.* 12.

Meyerhoff, M. & J.A. Walker (2007), "The persistence of variation in individual grammars: Copula absence in 'urban sojourners' and their stay-at-home peers, Bequia (St.Vincent and the Grenadines)", in *Journal of Sociolinguistics,* 11: 346-366.

Meyerhoff, M., J. Sidnell & J.A. Walker (2005), *Varieties of English on Bequia: A social and linguistic overview*, unpublished MS.

Millman, J. (2008), "An analysis of negation in Bequia English", supervised by M. Meyerhoff, unpublished Honours dissertation, University of Edinburgh.

Ng, Z. (2008), "'Dem TH's are dat ting dat happens on de island all de time' A quantitative study of TH-stopping on the Caribbean Island of Bequia", supervised by M. Meyerhoff & A.E. Turk, unpublished Honours dissertation, University of Edinburgh.

Partridge, A. (2008), "Sociophonetic data collection: A case study on the Bequia corpus", supervised by M. Meyerhoff & A.E. Turk, unpublished Honours dissertation, University of Edinburgh.

Prescod, P., (2004), *A Grammatical Description of the Noun Phrase in the English-Lexified Creole of St Vincent and the Grenadines*. Phd Thesis. University of Paris III.

Price, N. (1988), *Behind the Planter's Back: Lower Class Responses to Marginality in Bequia Island, St. Vincent,* Basingstoke: Macmillan.

Sankoff, D., S.A. Tagliamonte & E. Smith (2005), *Goldvarb X: A variable rule application for Macintosh and Windows*, Department of Linguistics: University of Toronto.

Thomas, E.R. & G. Bailey (1998), "Parallels between vowel subsystems of African American Vernacular English and Caribbean anglophone creoles", in *Journal of Pidgin and Creole Languages,* 13: 267-296.

Turk, A., Nakai, S. & Sugahara, M. (2006), "Acoustic segment durations in prosodic research: a practical guide." In Sudhoff, S., Lenertov, D., Meyer, R., Pappert, S., Augurzky, P., Mleinek, I., Richter, N. & Schlieder, J. (eds). *Methods in Empirical Prosody Research,* 1-28 Berlin, New York: De Gruyter.

Veatch T.C. (1991), "English vowels: Their surface phonology and phonetic implementation in vernacular dialects", *Dissertations from ProQuest.* Paper AAI9200398.

Walker, J.A. & M. Meyerhoff (2006), "Zero copula in the Eastern Caribbean: Evidence from Bequia", in *American Speech*, 81.2: 146-163.

Wells, J.C. (1973). "Jamaican Pronunciation" in *London: Publications of the Philological Society* XXV. Oxford: Basil Blackwell.

Wells, J.C. (1982), *Accents of English: Beyond the British Isles* (vol. 3), Cambridge: Cambridge University Press.

Wolfram W., Hazen K., Tamurro J. R. (1997), "Isolation Within Isolation: A Solitary Century of African-American Vernacular English", in *Journal of Sociolinguistics* 1: 7-38.

Appendix 1: Cards used for data collection while in Bequia

Picture Cards:

See attached for actual pictures, a word summary per vowel is below:

Monothongs:

[a]: cat, hat, map, rat, sad, mat, tap, bat,

[ɑ]: barn, farm, cart, dark, card, car, shark, fork

[e]: rake, tape, hay, grey, bay, cake, gate, cave

[ɛ]: seven, bread, bed, red, head, hair, leg, egg

[i]: sea, tear, people, leaf, beer, bees, cheese

[I]: whip, rip, ring, list, bin, kiss, lip, king

[o]: bow, bone, stop, bowl, boat, goat, coat, road

[u]: two, spoon, blue, shoes, roof, boot, moon, book

[ʌ]: gun, bug , bun, drum, rum, plus, sun, nuts

Diphthongs:

[ai]: tiles, sky, pie, rice, dice, ice, lime, kite

[oi]: prize, toys, boy, soil, oyster, coin, oil, foil

[ou]: towel, south, mouse, house, mouth, fowl, cow, fountain

Other words: Space, vase, race, cage, face, paper, maze , storm, horn, sword, north, rope, heart, corn, door

Back up picture cards for consonants: zebra, zoo, zero, butter, bat, bag, bug, tree, mango, ring, finger, dog, three, bath, brother (religious), lawn, saw, teeth, tooth, father (religious kind), fishing rod, dog, roof, cutlass

Word cards:

Card 1: Side 1: Thread	**Side 2:** "You thread a needle"
Card 2: Side 1: Zebra	**Side 2: "**You saw two zebras there."
Card 3: Side 1: Zoo	**Side 2: "**You went to the zoo today"
Card 4: Side 1: Sue	**Side 2:** "Have you seen Sue there?"
Card 5: Side 1: butter	**Side 2: "**Do you like butter cake?"
Card 6: Side 1: but	**Side 2: "**You have nothing but a cake."
Card 7: Side 1: Think	**Side 2: "**You think an apple"
Card 8: Side 1: Stop	**Side 2: "**Where did they stop?"
Card 9: Side 1: Stab	**Side 2: "**What did they stab?
Card 10: Side 1: Bat	**Side 2: "**A bat lives there"
Card 11: Side 1: Bad	**Side 2:** "A bad cat lives there"
Card 12: Side 1: gum	**Side 2: "**chew gum a lot"

Card 13: Side 1: come **Side 2: "**You come home"

Card 14: Side 1: bag **Side 2:** "His bag is there"

Card 15: Side 1: back **Side 2:** "He comes back later"

Card 16: Side 1: zero **Side 2: "**There is zero left"

Card 17: Side 1: let **Side 2: "**He let him go"

Card 18: Side 1: little **Side 2: "**A little cat"

Card 19: Side 1: really **Side 2: "**A really small mouse"

Card 20: Side 1: light **Side 2: "**A very bright light"

Card 21: Side 1: thing **Side 2:** "One thing left"

Card 22: Side 1: buck **Side 2: "**Only a buck"

Card 23: Side 1: bug **Side 2: "**Only a bug"

Card 24: Side 1: tree **Side 2: "**a big tree fell**"**

Card 25: Side 1: drink **Side 2: "**You drink tea"

Card 26: Side 1: drank **Side 2: "**You drank it"

Card 27: Side 1: drunk **Side 2: "**You drunk it"

Card 28: Side 1: three **Side 2: "**She had three days"

Card 29: Side 1: mango **Side 2: "**Is there a mango here?"

Card 30: Side 1: finger **Side 2: "**He hurt a finger here"

Card 31: Side 1: ring **Side 2: "**He dropped the ring here"

Card 32: Side 1: saw **Side 2: "**She saw it"

Card 33: Side 1: law **Side 2: "**The law says**"**

Card 34: Side 1: running **Side 2: "**He was running away"

Card 35: Side 1: finger **Side 2: "**He hurt his finger

Card 36: Side 1: sing **Side 2:** "Birds sing well"

Card 37: Side 1: thin **Side 2: "**Too thin really"

Card 38: Side 1: this **Side 2:** "Go to this place"

Card 39: Side 1: them **Side 2:** "She saw them today"

Card 40: Side 1: north **Side 2:** "Head north maybe"

Card 41: Side 1: south **Side 2: "**Go south now"

Card 42: Side 1: paw **Side 2: "**He has a lucky paw"

Card 43: Side 1: flog **Side 2:** "They flog the man"

Card 44: Side 1: dog **Side 2: "**The dog is here"

Card 45: Side 1: cog **Side 2: "**You need a small cog"

Card 46: Side 1: hook **Side 2: "**There is a hook here"

Card 47: Side 1: book **Side 2:** "The book is good"

Card 48: Side 1: cook **Side 2:** "He can cook"

Card 49: Side 1: look **Side 2:** "Look at that"

Card 50: Side 1: took **Side 2: "**He took it"

Appendix 2: MANOVAs for vowel space questions

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
Area	Pillai's Trace	.840	3.258	4.000	18.000	.036	13.030	.719
	Wilks' Lambda	.160	5.995	4.000	16.000	.004	23.981	.940
	Hotelling's Trace	5.244	9.177	4.000	14.000	.001	36.708	.991
	Roy's Largest Root	5.244	23.598	2.000	9.000	.000	47.197	1.000

Appendix 2.i *MANOVA for [u] across areas using 4 speakers from each area.*

Oi/o Mount Pleasant: **Multivariate Tests(c)**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power(a)
vowel	Pillai's Trace	.491	2.414(b)	2.000	5.000	.185	4.827	.290
	Wilks' Lambda	.509	2.414(b)	2.000	5.000	.185	4.827	.290
	Hotelling's Trace	.965	2.414(b)	2.000	5.000	.185	4.827	.290
	Roy's Largest Root	.965	2.414(b)	2.000	5.000	.185	4.827	.290

Oi/o Hamilton: **Multivariate Tests(c)**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power(a)
vowel	Pillai's Trace	.600	3.755(b)	2.000	5.000	.101	7.510	.423
	Wilks' Lambda	.400	3.755(b)	2.000	5.000	.101	7.510	.423
	Hotelling's Trace	1.502	3.755(b)	2.000	5.000	.101	7.510	.423
	Roy's Largest Root	1.502	3.755(b)	2.000	5.000	.101	7.510	.423

Oi/o Paget Farm: **Multivariate Tests(c)**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power(a)
vowel	Pillai's Trace	.560	3.182(b)	2.000	5.000	.128	6.364	.367
	Wilks' Lambda	.440	3.182(b)	2.000	5.000	.128	6.364	.367
	Hotelling's Trace	1.273	3.182(b)	2.000	5.000	.128	6.364	.367
	Roy's Largest Root	1.273	3.182(b)	2.000	5.000	.128	6.364	.367

Appendix 2.ii *MANOVAs for start points of ɔi compared to o*

Ou/o Mount Pleasant: **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.709	6.090	2.000	5.000	.046	12.179	.617
	Wilks' Lambda	.291	6.090	2.000	5.000	.046	12.179	.617
	Hotelling's Trace	2.436	6.090	2.000	5.000	.046	12.179	.617
	Roy's Largest Root	2.436	6.090	2.000	5.000	.046	12.179	.617

Ou/o Hamilton **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.803	10.202	2.000	5.000	.017	20.405	.834
	Wilks' Lambda	.197	10.202	2.000	5.000	.017	20.405	.834
	Hotelling's Trace	4.081	10.202	2.000	5.000	.017	20.405	.834
	Roy's Largest Root	4.081	10.202	2.000	5.000	.017	20.405	.834

Ou/o Paget Farm **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.803	10.202	2.000	5.000	.017	20.405	.834
	Wilks' Lambda	.197	10.202	2.000	5.000	.017	20.405	.834
	Hotelling's Trace	4.081	10.202	2.000	5.000	.017	20.405	.834
	Roy's Largest Root	4.081	10.202	2.000	5.000	.017	20.405	.834

Appendix 2.iii *MANOVAs for start points of [ɔu] compared to o*

Oi/i Mount Pleasant: **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.805	10.345	2.000	5.000	.017	20.690	.839
	Wilks' Lambda	.195	10.345	2.000	5.000	.017	20.690	.839
	Hotelling's Trace	4.138	10.345	2.000	5.000	.017	20.690	.839
	Roy's Largest Root	4.138	10.345	2.000	5.000	.017	20.690	.839

oi/i Hamilton: **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.498	2.484	2.000	5.000	.178	4.967	.297
	Wilks' Lambda	.502	2.484	2.000	5.000	.178	4.967	.297
	Hotelling's Trace	.993	2.484	2.000	5.000	.178	4.967	.297
	Roy's Largest Root	.993	2.484	2.000	5.000	.178	4.967	.297

oi/i Paget Farm: **Multivariate Tests**

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.767	8.218	2.000	5.000	.026	16.436	.748
	Wilks' Lambda	.233	8.218	2.000	5.000	.026	16.436	.748
	Hotelling's Trace	3.287	8.218	2.000	5.000	.026	16.436	.748
	Roy's Largest Root	3.287	8.218	2.000	5.000	.026	16.436	.748

Appendix 2.iv ***MANOVAs for end points of [ɔi]/[i] across areas respectively using 4 samples of each vowel***

MP:

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.702	5.896	2.000	5.000	.048	11.792	.603
	Wilks' Lambda	.298	5.896	2.000	5.000	.048	11.792	.603
	Hotelling's Trace	2.358	5.896	2.000	5.000	.048	11.792	.603
	Roy's Largest Root	2.358	5.896	2.000	5.000	.048	11.792	.603

HM:

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.173	.523	2.000	5.000	.622	1.047	.098
	Wilks' Lambda	.827	.523	2.000	5.000	.622	1.047	.098
	Hotelling's Trace	.209	.523	2.000	5.000	.622	1.047	.098
	Roy's Largest Root	.209	.523	2.000	5.000	.622	1.047	.098

PF:

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
vowel	Pillai's Trace	.704	5.956	2.000	5.000	.048	11.913	.608
	Wilks' Lambda	.296	5.956	2.000	5.000	.048	11.913	.608
	Hotelling's Trace	2.383	5.956	2.000	5.000	.048	11.913	.608
	Roy's Largest Root	2.383	5.956	2.000	5.000	.048	11.913	.608

Appendix 2.v *MANOVAs for end points of [ai]/[i] across areas respectively using 4 samples of each vowel per area*

Ai: Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
Area	Pillai's Trace	.801	3.007	4.000	18.000	.046	12.030	.680
	Wilks' Lambda	.239	4.176	4.000	16.000	.017	16.705	.819
	Hotelling's Trace	3.009	5.266	4.000	14.000	.008	21.063	.891
	Roy's Largest Root	2.952	13.282	2.000	9.000	.002	26.564	.977

oi: Multivariate Tests(d)

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
Area	Pillai's Trace	.709	2.469	4.000	18.000	.082	9.875	.582
	Wilks' Lambda	.360	2.666	4.000	16.000	.071	10.662	.604
	Hotelling's Trace	1.586	2.776	4.000	14.000	.069	11.104	.605
	Roy's Largest Root	1.455	6.548	2.000	9.000	.018	13.097	.781

ou: Multivariate Tests(d)

Effect		Value	F	Hypothesis df	Error df	Sig.	Noncent. Parameter	Observed Power
Area	Pillai's Trace	.826	3.169	4.000	18.000	.039	12.676	.705
	Wilks' Lambda	.296	3.356	4.000	16.000	.036	13.424	.718
	Hotelling's Trace	1.969	3.446	4.000	14.000	.037	13.783	.711
	Roy's Largest Root	1.730	7.787	2.000	9.000	.011	15.573	.850

Appendix 2.vi *MANOVAs for end points of [ai], [ɔi] and [ɔu] across areas respectively using 4 samples from each area*